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Heavier Buying Still Awaited

Large Negotiations for Cars Apparently Hinge on Price of Steel—More Locomotives Placed—Japanese Orders and Inquiries Coming Freely—Tin Plate Active—New Tonnage Still Under Mill Shipments

WHILE prospects are favorable, a waiting attitude is more apparent among both buyers and sellers of steel. The volume of new business has been moderately increased but is considerably less than tonnage being shipped off the books, causing some further curtailment of capacity. In either case the change is slight and apparently no important fundamental changes in the situation are developing. On the whole consumption of steel continues large but buying lacks the stimulation of heavy new demands.

Where these latter may appear is a question but the railroads offer the best outlook especially in connection with equipment needs. The number of new cars in sight continues to be estimated at least 80,000 and strong faith is expressed that the bulk of these will be placed by the year-end. The indications suggest these negotiations are turning on the price of material and the settlement of this point to the satisfaction of the carriers undoubtedly will release a large tonnage to the mills. Whether the producers will be willing to make the concessions sufficient to bring out this business fully is yet to be determined. On the run of business, steel prices are well maintained and shading is limited in scope.

The best record of locomotive buying in several months is shown the past week with 70 placed. The Nickel Plate system has allotted 27,500 tons of rails for next year. The distribution of the 200,000 ton Pennsylvania order is yet to be made. The Chesapeake & Ohio has placed 17,000 tons of tie plates.

More weakness in pig iron and some softness in finished steel this week place IRON TRADE REVIEW composite at $43.32. Last week it was $43.70 and the average for October $43.84.

Building Is Promising

The building situation is regarded as promising. Eastern shape mills now are booking as much new tonnage as they are shipping. At New York 50,000 tons of school work is planned though this may not all be placed at this time. New inquiry for loft buildings at New York this week totals 9000 tons. Chicago lettings are heavier. Reported awards in all districts this week total 14,375 tons.

Iron Buyers Watching

Another slump in pig iron this week has lowered prices $1 further in the Chicago, southern Ohio and southern districts. Alabama iron is offered at $19. Basic has been sold at $22, valley. Buyers are moving slowly though the appearance in the market of some of the usually shrewdest of their number has caused comment. The American Radiator Co. has been doing some buying but whether it has closed for a large tonnage is not yet known.

Recent blowing out of a half dozen or more blast furnaces has cut down Connellsville coke consumption about 65,000 tons monthly. Coke production in that region now is down to 40 to 50 per cent of capacity. Furnace coke has fallen to $3.75. Two furnaces, one at Buffalo and another in the Mahoning valley may go in soon.

Puddling wages in November and December will be 50 cents per ton less as the result of a drop of 10 cents per 100 pounds in the bimonthly examination of bar iron sales. This is the first decline in eighteen months.

A large can manufacturer has placed 100,000 boxes of tin plate for December delivery with the leading producer and would take 200,000 boxes more for the same period if it were available. The demand for tin plate is active on all sides and the Steel Corporation mills this week ran at the highest rate of the present year.

Japan Buys Freely

Japanese buying calls for some important additional tonnages. One Pittsburgh maker received further orders the past week for about 20,000 tons of black sheets. Mahoning valley plants have booked round tonnages. A Chicago mill took 2000 tons additional. A new inquiry put out through the Japanese embassy at Washington calls for 20,000 tons of sheets including 13,000 tons of black, 3500 tons of galvanized, and 3500 tons of corrugated and also for 3000 tons of wire nails. Total Japanese buying of steel to date is about 70,000 tons.

Business Trend and Chart Section Page 1217

Pig Iron Market Still Is Drifting

Price Trend Continues Downward, While Purchasing in Volume Is Deferred—More Furnaces Going Out—No. 2 Foundry Sold at $22.50, Valley—2500 Tons of Basic Closed at $22, Valley

PITTSBURGH, Oct. 30.—The pig iron market has slumped back into quietness again, following purchases made by the Standard Sanitary Mfg. Co. for its Allegheny and New Brighton, Pa., plants, aggregating 2000 tons of No. 2 and No. 2X at $22.50 and $23, valley basis, respectively, divided among two or three producers. Other small sales, 50 to 300 tons of different foundry grades, carry figures in the same spread. It now develops the Mesta Machine Co., purchased only 250 tons of No. 2 iron from a Pennsylvania furnace at $22.50, valley basis. Inquiries pending involve relatively small lots. Nothing more has developed regarding the American Radiator Co.'s inquiry for 25,000 tons or more. The company now is negotiating for coke. Evidently the inquiry for iron was for the purpose of discovering if it could buy it cheaper than it could make it. Basic iron is openly quoted at $23 to $24, valley, but less has been done. One lot of 2500 tons going at $22. Two 100-ton lots of bessemer and one single carload were sold at $25, valley. Low phosphorus is quoted at $30. Only small sales are noted. No malleable or gray forge sales or inquiries are reported. It is understood a few iron contracts are being adjusted downward in harmony with the present market trend.

Buyers in Receptive Mood

Boston, Oct. 30.—Several factors during the past week, notably the American Radiator Co.'s reported purchase of a large tonnage and the blowing out of furnaces, have combined to make eastern buyers much more alert concerning the market. Nearly all large consumers in New England are in a receptive mood, and apparently are only waiting definite assurance that the low point has been reached before placing fairly substantial orders. They are showing keen interest in first quarter iron, and while eastern furnaces are reluctant to quote, negotiations are in progress quietly. Several eastern furnaces have recently gone out of blast. These include one Thomas, one Port Henry, and one Keystone stack. Other stacks are expected to go out this week. Recent buying has not been heavy. A Rhode Island consumer placed 1000 tons at a low figure, reported to be $21.50, Buffalo, for No. 2X (2.25 to 2.75 silicon). This, however, is not confirmed. Other sales of 200 and 300 ton lots of No. 2X iron have been entered at $23, eastern Pennsylvania furnace, which means $26.50 delivered. Rumors are current giving $23.50 as the eastern Pennsylvania furnace price but no definite sales have come to light and at least one furnace is holding to $23.50.

Some Good Inquiries Out

New York, Oct. 30.—Sales of pig iron in this territory during the past week probably did not exceed 4000 tons in the aggregate. New inquiry is somewhat improved, and a number of lots which have not yet reached the inquiry stage are under contemplation. The principal inquiry here is from the American Radiator Co., which in addition to the huge tonnage for Buffalo, is in the market for 2250 tons for Bayonne. This buyer placed 3500 tons of No. 2 plain with a maker in New Jersey. Inquiries now current include 2000 tons of malleable and foundry for the General Electric Co. at Erie, Pa. The Worthington Pump & Machinery Corp. has closed for 400 tons for its East Cambridge plant. The American Car & Foundry Co. placed a tonnage for Berwick, Pa. The Brown & Sharpe Mfg. Co., Providence, R. I., is understood to have placed a larger tonnage than the 700 tons involved in its inquiry. The Gould Coupler Co. is in the market for 500 to 1000 tons of malleable.

Extended Statistics of American Iron and Steel Production and Ingot and Casting Output, page 1266

Prices are unchanged. The Buffalo market is around $22, Buffalo, subject to shading and not much attention is being paid to silicon differentials. Eastern Pennsylvania foundry is around $23, furnace, subject to slight concessions and in some cases silicon differentials have been ignored. Virginia foundry continues to be quoted at $25 furnace and silicon differentials have been ignored in some instances.

Small Sales at Buffalo

Buffalo, Oct. 30.—Inquiry for pig iron totals approximately 10,000 tons, and sales probably are less than 7500 tons for the past week. One of the inquiries was for 2000 tons of foundry iron, placed later outside this district. The Gould Coupler Co. has been inquiring for 500 to 1000 tons of malleable, and another inquiry for 1000 tons is pending. The American Radiator Co.'s reported inquiry for 25,000 tons is understood to have been satisfied. The price is $22 with reports that this has been shaded in competitive selling, but no real confirmation. Sixteen furnaces out of 22 represented in this district are operating.

Basic Sold Down to $22

Cleveland, Oct. 30.—Sales of pig iron by the makers in the northern Ohio group are larger in the aggregate for October than September, and some encouraging features are beginning to appear, though the market still is quiet. Foundries and machine tool builders, according to a survey made by a large producer, are fairly active, particularly in southern Ohio, Indiana and Michigan, but are keeping down their inventories. A representative Ohio machine tool builder reported that it is busier than at any time since the war. Not all foundries or machine tool builders are comfortably situated, and say their sales are for immediate account, and hence they are following that policy in placing pig iron orders. Shipments of iron continue to reflect generally good foundry operations. One lake furnace interest in October shipped 3000 tons more than it made. Included in the week's transactions is a sizable tonnage of foundry iron for delivery in November, December, January and February, at trade paper quotations at time of delivery. Not much further buying for the first quarter has developed. A Cleveland producer had inquiries totaling around 10,000 tons for that quarter two weeks ago, and has not closed on any of it. Some additional sales have been made at $22.50, base valley, and it is believed that $22 can be done on tonnage. Some No. 2X iron has been sold from a Buffalo furnace at $22. A price of $24, furnace, is quoted by Cleveland makers for local delivery, and it is reported that a few sales of small lots were made at this figure, equivalent to $24.50, delivered. An inquiry for 500 tons of foundry iron for a northern Ohio user is pending. The sale of 2500 tons of basic iron has been made at $22, valley, or 50 cents under the price that applied on a smaller tonnage closed a week ago. Jackson county silvery irons have been reduced $2, the 8 per cent grade being quoted at $32.50. A similar reduction has been made on bessemer ferrosilicon. Two more furnaces represented in the northern Ohio group are scheduled to go out for relining in the near future.

Southern Market Lower

Cincinnati, O., Oct. 30.—Another drop of $1 is noted in southern pig iron, now quoted at $19 to $20, Birmingham. The market is at its lowest level since the war, and sellers believe it will ease off further. Inquiry for northern iron has picked up. The southern Ohio market still is $23, Ironton base. Products and sellers say that it is almost impossible for them to do business in the Great Lakes territory because of the keen competition from valley furnaces. A local seller quoted $19.50, Birmingham, on 1000 tons of standard southern iron for spot shipment. The Detroit user inquiring for the tonnage stated he could buy cheaper elsewhere. Orders mainly are for small lots. The Ross-Meehan Foundries Co., Chattanooga, Tenn., closed for 1000 of malleable iron for the first quarter. The Hamilton Foundry & Machine Co., Hamilton, O., purchased 500 tons from a Hamilton producer. The Hoosier Iron Works, Kokomo, Ind., closed on 200 tons of charcoal. A sale of 250 tons of south-

ern to an Evansville, Ind., user is noted. A user south of the Ohio river took 200 tons of the same grade for November and December. The only important inquiry is from Detroit for 1000 to 1500 tons of southern iron. The American Foundry & Castings Co., Dayton, O., still negotiates for 500 tons of northern iron. The Marting Iron & Steel Co., is contemplating closing its remaining furnace, Etna, on Nov. 1. By that time the furnace of the Hanging Rock Iron Co., Ironton, O. will be out of blast.

Buying at Lowest Level

St. Louis, Oct. 29.—Pig iron buying and inquiry have fallen to the lowest level in many months. The only sales are scattering car lots, the total of which is less than 500 tons. Producers are offering iron but melters are showing no interest, despite price reductions. Selling agencies report the keenest sort of competition. At this season in the past fair business has been placed for first quarter delivery. So far as can be learned nothing has been sold yet for that delivery. The only inquiry for shipment further ahead than December was from a Tennessee melter asking prices on 1500 to 2000 tons of malleable.

Recession in buying of raw materials is a reflex of gradual shrinkage in the melt. Thus far this has not been startling, but current activity is based mainly on old orders, the volume of which is being reduced by recent shipments.

Prices continue weak and uncertain. Sales of Southern iron as low as $19, Birmingham, are reported, though the tonnages involved were not large. On northern iron $24, Chicago, can be done.

Chicago Price Views Firmer

Chicago, Oct. 30.—Although northern iron is weaker, with sales as low as $24, sellers are giving evidence of a slight stiffening sentiment. Some are not anxious for first quarter business under $25. The feeling is quite general melters will be compelled to increase buying about Dec. 1. Malleable melters are slightly more active in operations. One selling interest believes a definite turn for the better is due within 30 days. The matter of price is confused. It is definitely stated sales of foundry and malleable have been made at $24 Chicago furnace. Some sales have been made to the north to meet Algoma competition, and to the South and east to meet southern competition, at prices figuring to $23.50, Chicago. At present the Chicago market appears to be $24. One Michigan melter has taken 500 tons of malleable and a northern Illinois user 300 tons of foundry iron. It is reported most business is in less than 500-ton lots. A Racine, Wis., melter took 500 tons of malleable at $25, delivered. Southern selling is negligible. One Birmingham interest is quoting $19, Birmingham, and it is reported some Tennessee iron has been sold at a price figuring back to $19, Birmingham. Some Birmingham producers refuse to quote under $21. Charcoal iron is weak. A Kalamazoo melter took 500 tons at $26, furnace, but the Chicago quotation still is based at $27, furnace. Several small sales of silveries have been made at a reduction of $2.

(Concluded on page 1204)

Coke Consumption Is Cut

Connellsville Ovens Lose Outlet for 65,000 Tons Monthly by Recent Furnace Retrenchment—Foundry Grade in Better Demand

COKE PRICES, PAGE 1205

Pittsburgh, Oct. 30.—Retrenchment policies of blast furnace operators, recently effective, bring about a loss to the Connellsville region of approximately 65,000 tons of beehive coke monthly. The Eastern Steel Co., Witherbee, Sherman & Co., the Reading Iron Co., Thomas Iron Co., Canadian Furnace Co., at Port Colborne, N. Y., and the Shenango Furnace Co., are among those blowing out furnaces. One Buffalo furnace interest has turned to by-product coke, at less than the equivalent of $3.75 for Connellsville, beehive coke. Some coke operations are being reduced by 50 per cent. General average coke oven operation, including ovens making foundry coke, now are 40 to 45 per cent. New negotiations for blast furnace fuel are confined to the Struthers Furnace Co., and the American Radiator Co. The latter wants 10,000 tons monthly over the remainder of the year and the former 15,000 tons. The lowest quotations filed on these two inquiries are $3.75 Others are quoting $4. Negotiations for furnace coke to be shipped abroad apparently have fallen through. Heating coke sales are limited but some inquiries are pending for small lots for salamander use. The prices range from $3.25 to $3.75. Standard selected 72-hour foundry fuel has had a better sale in the past 48 hours than in several days preceding, numerous contracts for the remainder of the year being closed, and numerous spot purchases made at $4.75 to $5.50. A few sales of premium brands are noted, involving up to 300 tons at $6.50 to $7. Several small inquiries for the foundry grade are pending. Production, according to the *Connellsville Courier*, for the week ended Oct. 20 was 201,330 tons as compared with 207,840 tons the production for the preceding week.

Shipments Balance Production

Cincinnati, O., Oct. 30.—Demand for coke still is limited to small prompt lots. Prices are unchanged, but weak. The Eaton Rhodes & Co., will continue its quotation on Solvay by-product foundry coke at $9, Connellsville ovens, for November. The Indianapolis and Terra Haute, Ind., makers are undecided as to what their positions will be for next month. Producers of by-product coke report their shipments about equal production. A leading producer has specifications for November exceeding 12,000 tons. Wise county foundry coke has been moving better than for several weeks, while offers of Connellsville foundry coke at $5 to $5.50, ovens, are rejected by users. An inquiry for 500 tons of Connellsville foundry coke has been received from a user in Michigan.

Coke Offered for First Half

Boston, Oct. 30.—Books for the first half have been opened by by-product foundry coke producers. Early indications point to fairly heavy covering for foundries. Contracts are being entered on the basis of price at time of shipment. The domestic demand for coke recently declined and dealers are giving more attention to the foundry trade. The New England Coal & Coke Co. reduced its price on foundry coke, effective Oct. 27, to $12.50, delivered. The previous price was $13.50. The Providence Gas Co. has announced a reduction effective Oct. 27. Its new price will be $12.50. Foundries seem slow to build up coke reserves for the winter months. The new prices, however, are expected to develop some business.

By-Product Prices Lowered

New York, Oct. 30.—Lower prices are offered on by-product foundry coke. The New England Coal & Coke Co. and the Providence Gas Co. are reducing their prices by $1 a ton, the new figure being 12.50c, delivered at the usual New England consuming points. The reduction in this district is only 50 cents. The Seaboard By-products Co., effective Nov. 1, will quote on standard by-product foundry coke $10.91 delivered at Newark and other northern New Jersey consuming points, which will compare with the present price of $11.41. Standard beehive foundry coke for spot shipment continues obtainable at $4.75 to $5.25, Connellsville, while special brands sell occasionally as high as $6.50. Generally the demand for coke is quiet.

Detroit Producer Reduces Price

Detroit, Oct. 30.—Price of foundry coke has been reduced $1 a ton to $11 a ton, ovens, by the largest producer in this section, effective Nov. 1. According to officials, production is at full capacity, the demand for domestic coke being large.

Foundries Well Supplied

St. Louis, Oct. 30.—By-product coke plants in the district continue to produce at the rate which they have maintained in recent weeks, despite the fact that their shipments are considerably less than current output. The necessity of furnishing gas to certain communities precludes any material reduction in output. Minus the usual backlog of orders, the ovens are anxious to place business. Beehive coke continues extremely quiet, with prices still on the downward slant. Standard Connellsville 72-hour foundry coke is offered at $4.75 to $5.25, with takers lacking. Foundries are well supplied.

Southern Market Weak

Birmingham, Ala., Oct. 29.—The coke market in the South is weak. Quotations are indefinite, and consumers are buying only for immediate needs. Production is being curtailed. Railroad service is as good as could be expected. Some coke still is being shipped from the Birmingham district to the Southwest. The quotations range from $6 to $7.50 on furnace and foundry coke, the higher price applying to select beehive and by-product foundry grades.

Pig Iron Still Drifting

(*Concluded from page* 1203)

No activity is noted in phosphorus iron.

Price Levels Uncertain

Philadelphia, Oct. 30.—The pig iron market here is uncertain as to prices. While the general run of foundry grades are bringing $23, furnace, with occasional waiving of silicon differentials, much lower than this has been done on exceptionally attractive tonnages. During the past week, as low as $21, base furnace, was quoted. This price was named under special circumstances which indicate that this quotation is no real market factor. The buying during the past week of two large consumers generally regarded in this district as among the shrewdest buyers, along with the large inquiry of the American Radiator Co. at Buffalo, and the fact that several more furnaces have blown or will blow out soon, are regarded as indications promising stronger market conditions. This is particularly true because the present prices are from $3 to $4 under cost. An interesting development last week was the importation here of a lot of 1000 tons of French iron. French foundry iron, 2.00 to 2.50 silicon and 1.70 phosphorus, is offered now at $21.75, duty paid. Standard Virginia foundry has been sold in carload lots at $24, furnace to several buyers.

The Dunbar, Pa., furnace, now on spiegeleisen, will blow out Nov. 2 or 3. The Reading Iron Co. banked its Keystone furnace Oct. 28 for an indefinite period. The Lochiel furnace of Edward Marshall, Lochiel, Pa., is expected to go out of blast soon, as is the Hokendaqua furnace of the Thomas Iron Co.

Elect New President

Pittsburgh, Oct. 30—D. P. Bennett, vice president since 1915 of the Pittsburgh Steel Co., this city, was elected president today to succeed the late Willis F. McCook. The latter's place on the board of directors now is filled by Harry J. Miller. Edward H. Bindley was elected vice president to succeed Mr. Bennett.

Many Bids For Scrap In American Warships

Washington, Oct. 30.—Bids for six naval vessels on the ways at navy yards, to be sold under the naval limitation treaty, were opened Oct. 25 and are under advisement by Admiral Potter, chief of the bureau of supplies and accounts. Bids on battleships afloat will be opened Nov. 1.

Bids submitted at the Oct. 25 sale for vessels to be scrapped by purchasers were: Columbia Steel Corp., San Francisco, for the MONTANA, 5587 tons of metal, $44,400; the Merritt Chapman & Scott Corp., New York, for the UNITED STATES, 2410 tons, and the CONSTITUTION, 3440 tons, $10,000 and $5000 respectively, Hyman-Michaels Co., Chicago, for the INDIANA, 7943 tons, $31,189; the SOUTH DAKOTA, 9190 tons, $35,391; the UNITED STATES, $45,640; the CONSTITUTION, $41,992 and the NORTH CAROLINA, 8580 tons, $24,554. Bids for these vessels in groups of two and in some cases singly were submitted by the Continental Machinery Co., New York; N. Block & Co., Norfolk, Va.; Mayer Pollock, Pottstown, Pa.; Larner Rosenthal, Oakland, Cal.; Boston Iron & Metal Co., of Baltimore; J. Goldberg & Sons, Kansas City; Bond Bros., Co., San Francisco; Hickman, Williams & Co., Philadelphia; E. B. Leaf Co., Philadelphia; Charles S. Hoffman and G. Weissbaum, San Francisco; and Fred W. Erickson, New York. Bids on the metal to be cut by the government ranged from $2.37 a gross ton for metal in the INDIANA and SOUTH DAHOTA by M. Samuel & Sons, Brooklyn, to $13.51 a gross ton for metal in the NORTH submitted by the Steel Scrap Corp., CAROLINA to be cut to charging hox size, Philadelphia.

Leslie R. Veath, Inc., manufacturer of milling machinery, of Buffalo, has filed a petition in bankruptcy at Rochester, N. Y. Liabilities are listed at $19,081, and assets of $3050.

Prices Present and Past

Representative market figures yesterday, and for last month, three months ago and one year ago

	Oct. 31, 1923	Sept. 1923	July 1923	Oct. 1922
PIG IRON				
Bessemer, valley del., Pitts....	$26.77	28.27	28.52	35.12
Basic, valley	22.00	25.00	25.15	30.60
Basic, eastern del., eastern Pa..	23.50	25.10	27.25	30.25
*No. 2 foundry, del. Pitts.....	24.27	26.52	27.37	33.62
*No. 2 foundry, Chicago.....	24.00	26.75	28.00	31.75
*Southern No. 2, Birmingham...	19.00	22.75	25.00	27.40
*Southern Ohio, No. 2, Ironton.	23.00	24.90	26.50	32.40
**No. 2X, Virginia furnace	24.50	25.50	27.25	33.00
**No. 2X, eastern del., Phila..	24.01	26.21	28.00	33.00
Malleable, valley	22.50	24.60	25.50	32.30
Malleable, Chicago.....	24.00	26.75	28.00	31.75
Lake Superior charcoal, Chicago	30.04	32.04	36.65	36.15
Gray forge, val. del. Pittsburgh	23.77	26.27	27.02	33.27
Ferromanganese, del. Pitts.....	112.79	114.79	122.29	105.47
SEMIFINISHED MATERIAL				
Sheet bars, bessemer, Pittsburgh.	42.50	42.50	42.50	39.85
Sheet bars, open-hearth, Pitts....	42.50	42.50	42.50	39.85
Billets, bessemer, Pittsburgh ...	41.50	42.50	42.50	40.00
Billets, open-hearth, Pittsburgh..	41.50	42.50	42.50	40.00
FINISHED MATERIAL				
Steel bars, Pittsburgh.....	2.40	2.40	2.40	2.00
Steel bars, Chicago.....	2.50	2.50	2.50	2.00
Steel bars, Philadelphia.....	2.72	2.72	2.72	2.325

	Oct. 31, 1923	Sept. 1923	July 1923	Oct. 1922
FINISHED MATERIAL (Continued)				
Iron bars, Philadelphia	$2.62	2.72	2.72	2.325
Iron bars, Chicago mills.....	2.40	2.38	2.55	2.50
Beams, Pittsburgh.....	2.50	2.50	2.50	2.00
Beams, Philadelphia	2.72	2.82	2.82	2.325
Beams, Chicago	2.60	2.60	2.60	2.10
Tank plates, Pittsburgh.....	2.50	2.50	2.50	2.05
Ttank plates, Philadelphia	2.72	2.82	2.82	2.425
Tank plates, Chicago.....	2.60	2.60	2.60	2.10
Sheets, blk., No. 28, Pittsburgh.	3.75	3.75	3.85	3.50
Sheets, blue anl., No. 10, Pitts.	3.00	3.00	3.00	2.60
Sheets, galv., No. 28, Pittsburgh.	4.85	5.00	5.00	4.50
Wire nails, Pittsburgh.....	3.00	3.00	3.00	2.70
COKE				
Connellsville furnace	3.75	4.55	4.35	10.60
Connellsville foundry, ovens.....	4.75	5.70	5.15	12.10
OLD MATERIAL				
Heavy melting steel, Pittsburgh.	15.00	18.00	18.25	21.35
Heavy melting steel, eastern Pa.	15.00	16.85	17.25	18.00
Heavy melting steel, Chicago....	13.50	16.55	17.10	18.50
No. 1 wrought, eastern Pa....	17.75	19.00	18.85	22.50
No. 1 wrought, Chicago.....	13.50	18.25	16.60	20.40
Rails for rolling, Chicago.....	15.00	18.30	18.40	20.50

*1.75 to 2.25 silicon. **2.25 to 2.75 silicon

Composite Market Average

Representing the Combined Average Prices per Ton of Fourteen Leading Iron and Steel Products Yesterday, One Week, One Month, Three Months, One Year and Ten Years Ago

Oct. 31, 1923	Oct. 24, 1923	September, 1923	July, 1923	October, 1922	October, 1913
$43.32	$43.70	$44.64	$45.39	$43.60	$24.91

Products Included Are Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

Iron and Steel Prices

SCRAP PRICES, PAGE 1268, WAREHOUSE PAGE 1260, ORE, NUTS, BOLTS AND RIVETS AND PIPE PRICES, PAGE 1264

Pig Iron

Prices per gross ton

Bessemer, valley	$25.00
Bessemer, Pittsburgh	27.02 to 27.27
Basic, valley	22.00 to 23.00
Basic, Pittsburgh	23.77 to 24.77
Basic, Buffalo	23.00
Basic, del., eastern Pa.	23.00 to 24.00
Malleable, valley	22.50 to 23.00
Malleable, Pittsburgh	24.22 to 24.77
Malleable, Chicago	24.00
Mal'eable, Buffalo	22.00
Malleable, del., eastern Pa.	24.00 to 25.00

FOUNDRY IRON SILICONS

No. 2 Northern	1.75 to 2.25
No. 2 Southern foundry	1.75 to 2.25
No. 2X East'n and Virginia	2.25 to 2.75
No. 1X Eastern	2.75 to 3.25
No. 1 Chicago	2.25 to 2.75
No. 2 foundry Eastern	1.75 to 2.25

No. 1X, eastern del., Phila.	24.26 to 24.76
No. 1X, Buffalo	22.00 to 22.50
No. 2 foundry, valley	22.50 to 23.00
No. 2 foundry, Pittsburgh	24.27 to 25.77
No. 2 foundry, Buffalo	22.00
No. 2 foundry, Chicago	24.00
No. 2 foundry, Granite City	26.50 to 27.50
No. 2 foundry, Ironton furnace	23.00
No. 2 foundry, Cleveland, del.	24.25 to 24.50
No. 2 foundry, del., Phila.	23.76
No. 2 foundry, N. J. tidewater	24.13
No. 2X, eastern del., Phila.	23.76 to 24.26
No. 2X, east. N. J. tidewater	24.63
No. 2X, eastern del., Boston	26.65 to 27.16
No. 2X foundry, Buffalo fur.	22.00 to 22.50
No. 2V, Buffalo, del. Boston	26.42 to 26.92
No. 2 southern, Birmingham	19.00 to 20.00
No. 2 southern, Cincinnati	23.05 to 24.05
No. 2 southern, Chicago	25.01 to 26.01
No. 2 southern, Philadelphia	26.80 to 27.80
No. 2 southern, Cleveland	25.01 to 26.01
No. 2 southern, Boston (rail and water)	25.91 to 26.91
No. 2 southern, St. Louis	24.17 to 25.17
No. 2X, Virginia furnace	24.50 to 25.50
No. 2X, Virginia, Phila.	29.77 to 30.77
No. 2X, Virginia, Jersey City	30.04 to 31.04
No. 2X, Virginia, Boston	31.42 to 31.92
Gray forge, eastern Pa.	23.50
Gray forge, val. del., Pitts.	23.77 to 24.27
Low phos., standard, valley	30.00
Low phos., standard, Phila.	30.00
Low phos., Lebanon, furnace	28.00
†Low phos. English, delivered Phila. territory	29.26 to 30.64
Charcoal, Birmingham	32.00 to 33.00
Charcoal, Superior, Chicago	30.04

Silvery Iron

Jackson County, Ohio, furnace

7 to 8 per cent	31.00
8 to 9 per cent	32.50
9 to 10 per cent	34.50
10 to 11 per cent	36.50
11 to 12 per cent	39.00
12 per cent	41.50

Bessemer Ferrosilicon

Jackson County, Ohio, furnace

10 to 11 per cent	41.50
11 to 12 per cent	44.00
12 to 13 per cent	46.50

Ferroalloys

†Ferromanganese 78 to 82 per cent, tidewater, or furnace first hand and resale	$107.00 to 110.00
Ferromanganese, delivered, Pittsburgh	111.79 to 114.79
Spiegeleisen 19 to 21 per cent furnace or tidewater	38.00 to 45.00
Ferrosilicon, 50 per cent contract freight allowed	80.00 to 82.50
Ferrotungsten standard, per pound contained	85.00 to 90.00
Ferrochrome, 60 to 70 chromium, 4 to 6 carbon per pound contained, delivered	12.00
Imported ferrochrome, 4 to 6 per cent carbon	nominal
Ferrovanadium, 30 to 40 per cent per pound estimated, according to analysis	3.50 to 4.00
Ferro carbon-titanium, carloads, producer's plant, per net ton	$200.00

†Duty paid.

Coke

Beehive, Ovens

Prices per net ton

Connellsville furnace	$3.75 to 4.00
Connellsville foundry	4.75 to 5.50
New River foundry	11.50 to 12.00
Wise county furnace	5.25 to 6.25
Wise county foundry	5.75 to 6.25
Alabama furnace	6.00 to 7.00
Alabama foundry	7.00 to 7.50

By-Product

Foundry, Newark, N. J., del.	$10.91
Foundry, Chicago, ovens	12.50
Foundry, Boston, delivered	12.50
Foundry, Granite City, Ill.	13.00
Foundry, Alabama	6.50 to 7.50

Semifinished Material

Prices per gross ton

BILLETS AND BLOOMS

4 x 4-inch base

Open-hearth, Pittsburgh	$40.00 to 42.50
Open-hearth, Youngstown	40.00 to 42.50
Open-hearth, Philadelphia	46.67 to 47.67
Bessemer, Pittsburgh	40.00 to 42.50
Bessemer, Youngstown	40.00 to 42.50
Forging, Pittsburgh	47.50
Forging, Philadelphia	51.67 to 52.67

SHEET BARS

Open-hearth, Pittsburgh	$42.50
Open-hearth, Youngstown	42.50
Bessemer, Pittsburgh	42.50
Bessemer, Youngstown	42.50

SLABS

Pittsburgh	$40.00 to 42.50
Youngstown	40.00 to 42.50

WIRE RODS

¼-inch and finer

Wire rods, Pittsburgh, $51.00

Standard extras, $2.50 per ton over ¼-inch; $5 for screw stock; $15 for acid wire rods. Carbon extras, $3 for 0.20 to 0.40; $5 for 0.41 to 0.55; $7.50 for 0.56 to 0.75; $10 over 0.75.

SKELP

Grooved skelp, Pittsburgh	2.40c
Universal skelp, Pittsburgh	2.40c
Sheared skelp, Pittsburgh	2.40c

Shapes, Plates and Bars

Prices per pound

Structural shapes, Pittsburgh	2.50c
Structural shapes, Phila.	2.67c to 2.82c
Structural shapes, New York	2.69c to 2.84c
Structural shapes, Chicago	2.60c
Tank plates, Pittsburgh	2.50c
Tank plates, Philadelphia	2.72c to 2.82c
Tank plates, New York	2.74c to 2.84c
Tank plates, Chicago	2.60c
Bars, soft steel, Pittsburgh	2.40c
Bars, soft steel, Philadelphia	2.72c
Bars, soft steel, New York	2.74c
Bars, soft steel, Chicago	2.50c
Bars, refined iron, Pittsburgh	3.25c to 5.00c
Bars, rail steel, Chicago	2.30c
Bars, rail steel, mill	2.15c to 2.35c
Reinforcing bars, billet, Pitts.	2.40c
Bar iron, common, Phila.	2.57c to 2.67c
Bar iron, common, New York	2.59c to 2.69c
Bar iron, common, Chicago	2.40c
Bars, forging quality, Pitts.	2.65c

Hoops, Bands, Shafting

Prices per pound

Hoops, Pittsburgh, under 5 in.	3.00c to 3.15c
Hoops, Pittsburgh, 20 gage, under 1 in.	3.30c
Bands, Pittsburgh	3.00c to 3.15c
Cold finished steel bars, Pittsburgh base	3.00c to 3.25c
Steel shafting, Pittsburgh	3.00c to 3.25c
Cotton ties, bundle 45 lb. Pittsburgh	$1.64

Rails, Track Material

Standard bessemer rails, mill	$43.00
Standard open-hearth rails, mill	43.00
Relaying rails, St. Louis	30.00 to 35.00
Relaying rails, Pittsburgh	30.00 to 34.00
Light rails, 25 to 45, mill	2.25c
Angle bars, Chicago base	2.75c
Spikes, railroad, Pittsburgh	3.15c
Spikes, small railroad, Pitts.	3.50c
Spikes, boat and barge, Pitts.	3.50c
Spikes, railroad, Chicago	3.25c
Track bolts, Pitts. Standard	4.00c
Track bolts, Pitts., small	4.75c to 5.00c
Track bolts, Chicago	4.25c
Tie plates, Pittsburgh	2.60c
Tie plates, Chicago	2.60c

Spike, tie plate and truck bolt prices for carlots.

Wire Products

To Jobbers in Carloads

Prices per pound

Wire nails, Pittsburgh	3.00c
Galv'd nails, 1-inch and over	5.25c
Plain wire, Pittsburgh	2.75c
Annealed wire, Pittsburgh	2.90c
Galvanized wire, No. 9 gage, Pittsburgh	3.35c
Barbed wire, painted, Pitts.	3.45c
Barbed wire, galv., Pitts.	3.80c
Polished staples, Pittsburgh	3.45c
Galvanized staples Pittsburgh	3.80c
Coated nails, count keg, Pittsburgh	2.60c to 2.70c
Woven wire fencing (retailers)	65 off
Woven wire fencing (jobbers)	67½ off

Chain, Piling, Strip Steel

Prices per pound

Chain, 1-in. proof coil, Pitts.	6.50c
Sheet piling base, Pittsburgh	2.55c
Hot rolled strip steel, Pittsburgh stamping quality	3.00c to 3.15c
Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100-inch and heavier, 0.100-inch and heavier, base	5.00c

Sheets

SHEET MILL BLACK

Prices per pound

No. 28, open-hearth, Pitts.	3.75c to 3.85c
No. 28, bessemer, Pitts.	3.75c to 3.85c
No. 28, open-hearth, Phila.	4.07c to 4.17c
No. 28, open-hearth, Chicago	4.09c to 4.19c

TIN MILL, BLACK

No. 28, open-hearth, Pitts.	3.85c
No. 28, open-hearth, Chicago	3.84c

GALVANIZED

No. 28, open-hearth, Pitts.	4.85c to 5.00c
No. 28, bessemer, Pittsburgh	4.85c to 5.00c
No. 28, open-hearth, Phila.	5.17c to 5.32c
No. 28, open-hearth, Chicago	5.19c to 5.34c

BLUE ANNEALED

No. 10, open-hearth, Pitts.	3.00c
No. 10 bessemer, Pittsburgh	3.00c
No. 10, open-hearth, Phila.	3.32c
No. 10, open-hearth, Chicago	3.34c

AUTOMOBILE SHEETS

No. 22 Pittsburgh	5.35c

Tin Plate

Prices per 100-pound box

Tin plate, coke base, Pitts.	$5.50

Iron and Steel Pipe

Base Discounts Pittsburgh to Jobbers in Carloads

	Black	Galv.
1 to 3-inch, butt steel	62	50½
1 to 1½-inch, butt iron	30	13

Boiler Tubes

Less Carload Discounts—Carloads 4 Points Additional

Steel 3¼ to 3¾-inch	38½
Charcoal iron, 3¼ to 4½-inch	5
Seamless hot rolled, 3½ to 3¾-inch	35

Cast Iron Water Pipe

Prices per net ton

Class B Pipe

Four-inch, Chicago	63.20
Six-inch and over, Chicago	57.20
Three-inch, Birmingham	59.00 to 60.00
Four-inch, Birmingham	53.00 to 54.00
Six-inch and over, Birmingham	49.00 to 50.00
Four-inch, New York	68.60
Six-inch and over, New York	63.60

Standard fittings, Birmingham, base, $110.00 6 to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $20; 3-inch, plus $20; gas pipe fittings, $5 higher.

Class A pipe is $5 higher than Class B.

Roads Market Much Scrap

Unusually Large Lists Being Offered—Dealers Buying Much at Lower Level As Speculation—Gradual Decline Continues

SCRAP PRICES, PAGE 1268

Chicago, Oct. 30.—In the face of further declines in iron and steel scrap, railroads are throwing onto the market the largest tonnages in months. That these offerings will be readily absorbed is not doubted, for many dealers seem inclined to buy in anticipation of the increased business believed destined to come from railroad car buying and improvement of the steel industry in general. Railroad offerings include 31,000 tons by the Pennsylvania eastern region, 14,000 tons central region, 7200 tons southwestern region and 3000 tons northwestern region; 11,000 tons by the Illinois Central, 1000 tons by the Chicago, Milwaukee & St. Paul, 7600 tons by the Burlington, 3000 tons by the Sante Fe, 1900 tons by the Great Northern, 700 tons by the Chicago & Alton and 1600 tons by George W. Jenings, while the Erie, New York Central and Michigan Central have blind lists. Although heavy melting steel continues unchanged at $13.50 to $14, many grades have sagged 50 cents to $1. Some small sales are being made to melters but they represent only spot requirements. Most dealers in scrap are bearish and look for further weakness before real strength develops.

New Low Prices Made

Boston, Oct. 30.—The bottom in the iron and steel scrap market was not reached a week ago and further declines have been made during the last few days. The American Steel & Wire Co., Worcester, Mass., has been buying heavy melting steel at $13 but as the chief outlet comes from the Pennsylvania steel works where $15, delivered, is the maximum price, the local market is more correctly represented by sales at $10, which is the top figure for doing business with Pennsylvania consumers. Some borings and turnings have been shipped to blast furnaces in Pennsylvania at $7, shipping point. Trading is exceedingly dull, as few dealers are willing to accept the present low prices as stable. The Maine Central railroad offered 1500 tons of rails and then refused to sell because bids were too low. The Boston & Maine railroad has another 1500 tons of rails which will be offered and much other miscellaneous scrap will come into the market through trolley line and railroad sales. Cast grades, which held firm after steel scrap had started to tumble, are weakening. A Claremont, N. H., consumer bought No. 1 machinery scrap at $22.25, delivered, during the week and sales at points nearer Boston have been made as low as $21, delivered, for the same grade. Heavy cast is offered at from $17 to $18.

New York Still Declines

New York, Oct. 30.—Iron and steel scrap has declined further in several grades. Borings, cast iron car wheels, railroad wrought and wrought pipe are off $1, and rerolling rails, No. 1 heavy melting steel and No. 1 railroad steel are down 50 cents. A sharp reduction has also been made in shafting, the market now holding at $14 to $15, f.o.b. New York. The situation generally is listless. The Bethlehem Steel Co., is paying $14.75, delivered, for the better grades of heavy melting steel. Little interest is being shown in this district by Pittsburgh consumers.

Big Railroad Lists Out

Pittsburgh, Oct. 30.—In excess of 110,000 tons of scrap are offered by four railroads for closing this week. Some traders do not believe the market is sufficiently strong to absorb this tonnage and weakness is increased on that account. The two largest lists are those of the Pennsylvania and Baltimore & Ohio roads. The four regions of the former railroad present a total in excess of 50,000 tons. That of the Baltimore & Ohio, which closed yesterday, erceeded 29,000 tons. The two other lists are those of the New York Central and Erie railroads. Consumer buying is limited, the Weirton, W. Va., user continuing to absorb fair-sized lots, usually 1000 to 2000 tons at a time, at $15.50, and Monessen, Pa., taking two or three carloads at a time with an occasional larger tonnage at around the same figure, making the heavy melting steel scrap market quotable at $15 to $15.50, the same as late last week. Two lots of shovel turnings were bought by a dealer yesterday at $13; others will pay only $12.50. That market is accordingly up 50 cents per ton although several other grades are 50 cents below the prevailing levels of a week ago. The Brackenridge, Pa., consumer remains uninterested except at the figure it is bidding on machine shop turnings, cast iron borings, heavy breakable cast, etc., which are so low that dealers cannot cover. Woodlawn, Pa., is embargoed and the Butler, Pa., user still is out of the market.

Only Minor Buying Done

Buffalo, Oct. 30.—Only minor activity is noted in iron and steel scrap as mills do not want large tonnages. A little buying of heavy melting steel at $15 to $15.50 has been done and dealers believe $15 is the bottom of this market. New York Central, Erie, Michigan Central and Pennsylvania railroad lists will close Nov. 1. Some activity is apparent in No. 1 cast scrap with a Canadian demand offering $19 to $19.50, Buffalo. Blast furnace scrap buying is ligth.

Dealers Buy for Stock

Cleveland, Oct. 30.—Consumer buying of iron and steel scrap, aside from small tonnages being picked up quietly, does not deter dealers from laying down much material on yards. The latter believe this an opportune time to stock up, the impression being that users soon will be compelled to buy and the market will strengthen. Quotations on several grades have been marked down an average of 50 cents a ton within the past week, heavy melting steel now being held at $14 25 to $14.75; machine shop turnings, $10.25 to $10.50; shovel turnings for blast furnace use, $10.25 to $10.75; cast borings, $10.50 to $11. Contract shipments continue in large volume, consumers taking all material offered.

Yards Take Much Scrap

Detroit, Oct. 30.—The scrap market continues inactive with prices on most grades nominal. Some further recessions have been made. Short mixed and cast borings are off 50 cents to $1 a ton. Hydraulic compressed sheets are $1 a ton lower. Loose sheet clippings are off 50 cents a ton, and malleable $1 a ton.

Dealers find no inquiry from consumers and no sign when buying will be resumed. Yard dealers are taking in a large quantity of material as most large producers are operating at liberal capacity, especially automobile plants.

St. Louis Prices Lower

St. Louis, Oct. 29.—Further cuts in prices of iron and steel scrap have been made but for the most part the list remains unchanged. Heavy melting steel has touched a new low of $12, and cast grades are weaker, No. 1 falling to $18. Some steel specialties have declined 50 cents per ton. Mills and foundries are buying little and bargains uncovered by the decline fail to tempt them. Mills complain of lack of orders, and not much improvement is expected. Foundries are fairly well supplied with raw material, and are taking only current needs.

Railroads continue to offer liberally, and some industries are attempting to market their accumulations. Several automobile manufacturers have figured in late offerings. Dealers are lowering bids on railroad material, and are specifying deliveries and even asking for car numbers in submitting bids. Considerable scrap is being bought for laying down in yards, and stocks are much larger than six weeks ago. Nothing is coming in from the country, present market prices and freight rates making shipments prohibitive.

The Illinois Central offers 12,000 tons; the Pennsylvania, southwestern region, 7500 tons; Pennsylvania, northwestern region, 3000 tons; Santa Fe, 2800 tons and Chicago & Alton, 600 tons.

No Improvement in South

Birmingham, Oct. 30.—Iron and steel scrap presents no improvement and the market is dull. Deliveries on contracts are nearly completed and there have been no cancellations. Consumers have delayed deliveries somewhat and have bought cheaper scrap in the meantime. Borings and turnings have strengthened about $1 per ton. There have been no negotiations in heavy melting steel for some time. The Gulf States Steel Co. has resumed open-hearth production. This consumer has been dictating the price of steel scrap for some time.

Further Cuts Are Developed

Philadelphia, Oct. 30.—Iron and steel scrap are dull and the market has developed cuts in some grades. However, prices are not tested as most of the present activity is among dealers.

Suit asking for the appointment of a receiver for the Cincinnati Aluminum

Casting Co., Norwood, O., has been filed in the Hamilton County Common Pleas court, by Jack Lauer, who claims $25,000 from the company.

Reduced Price

On British Ferromanganese Does Not Stimulate Buying

FERROALLOY PRICES, PAGE 1205

New York, Oct. 30.—Reduction in the price of English ferromanganese from $117.50 to $110, duty paid tidewater last week has not induced any buying of this metal. Current business continues comprised of occasional carloads. While there is not a great deal of resale metal in the market, there is sufficient to take care of this demand. Resale prices continue to range from $107 to $110, duty paid tidewater.

While no new business has been reported in spiegeleisen during the past week in this district, makers say that they are receiving requests to hurry shipments on contracts. The market on 20 per cent metal, continues to range all the way from $38 to $45, furnace.

Slack demand for high speed steel alloys is resulting in lower prices for tungsten concentrates and ferrotungsten. During the past week ferrotungsten has been obtainable at 85c a pound contained; concentrates at $8 a short ton unit. Prices of other alloys and ores are unchanged.

Improvement Slightly Apparent

Pittsburgh, Oct. 30.—More or less indistinct and intangible signs of improvement are beginning to appear here and there in the ferroalloys market. So far this mainly involves ferromanganese. As yet this improvement is not manifest in any actual orders for large tonnages, and specifications for the past week total but 450 to 500 tons, coming from about four consumers. Several users, however, are interested in future requirements but except in one or two cases continue to defer buying for the first quarter. The announcement that the official English price now is $110, seaboard base, tends to clarify the situation somewhat. The sales reported were on the basis of $108 or $109.50, these quotations evidently being made by certain middle interests to shade the price maintained by domestic producers, namely $110 base. A single carload went at resale at $107, furnace.

Spiegeleisen interest is spasmodic. A few single carload orders came out the past week. Prices are unchanged. Small quantities, 3, 5 or 10-ton lots, alone are noted in connection with other alloys, such as ferrosilicon, ferrovanadium, ferrotungsten, etc.

Dissolve Scrap Company

Grant-Holub Co., Canton, O., dealer in iron and steel scrap, is being dissolved and its plant will be operated as a branch of the Grant Iron & Metal Co., Detroit. Harry S. Grant, president of the latter company, was president of the Canton concern and David C. Holub of the American Scrap Iron Co., Akron, O., was treasurer. Accounts will be assumed by the Grant Iron & Metal Co.

Firm on Sheet Bar Price

Makers Holding to $42.50, Despite Efforts of Buyers To Do Less—Few Semifinished Sales—More Bars Booked for Japan

SEMIFINISHED STEEL PRICES, PAGE 1205

Pittsburgh, Oct. 30.—Producers of semifinished material are waiting for specifications, and consumers are waiting for lower prices. Buyers are not ready to issue inquiries for first quarter. Some are holding up specifications on fourth contracts. They are endeavoring to have the sheet bar price reduced from $42.50, claiming they are unable to compete for sheet business. The sheet bar makers refuse to depart from the $42.50 level, claiming costs have been increased by the 8-hour day. The West Leechburg Steel Co., with increased strip mill capacity, is expected to be a larger buyer of billets, and some producers now are negotiating for the business. While certain billet makers will not go below $42.50, others are quoting $40. One or two 500 to 1000-ton inquiries appear from to time. No inquiries of size are current for forging billets. No recent sales are noted, the last reported here being a few last quarter contracts at $47.50, base Pittsburgh.

Prices Are Untested

Philadelphia, Oct. 30.—Billet business continues to be confined to occasional small lots. Prices are unchanged and are untested.

Sell More Sheet Bars for Japan

Cleveland, Oct. 30.—The leading producer of semifinished material continues to take on sheet bars for Japanese account. The bars are being sold on a basis of $42.50, valley, and are for conversion in this country. The amount closed this week was 2100 tons. Except for this, there is a complete absence of definite business, consumers making tentative inquiries from time to time but delaying purchases as long as possible while mills continue to hold sheet bars at $42.50. No further tonnage has been taken for the first quarter subject to prices at time of delivery.

Maintain $42.50 Price

Youngstown, O., Oct. 30.—New business in the semifinished market is lacking. Producers are centering their efforts on the filling of specifications on sheet bar contracts. Such activity, however, has fallen off perceptibly during the past two weeks, in view of the quietness in the sheet market. Sheet producers have reached the point where it is difficult to make up rolling schedules much before a week in advance and are ordering their sheet bars accordingly. No effort is being made to solicit tonnages of billets, slabs or sheet bars under $42.50, Youngstown, which price continues firm.

Wire Orders Holding Back

WIRE PRICES, PAGE 1205

Pittsburgh, Oct. 30.—Registering a fair percentage of gain over last month, October promises to roll up a large tonnage of orders for wire products. Incoming business still remains a trifle below production, although in no one case is a large stock being accumulated at the mill. The chief item before the trade is appearance of the formal inquiry from the Japanese government through the United States government for 3000 tons of nails. Variously reported in times past at 14,000, 7000 and 5000 tons, the actual inquiry calls for but 3000 tons and probably will be placed this week. Several producers here are at work on this requirement. Wire plant and nail mill operations remain at 70 to 80 per cent of capacity, jobbers in the domestic market specifying in a fairly liberal way. Demand mostly is for mixed carloads, containing in their order of importance at present, nails, plain wire either bright or galvanized, barbed wire, and staples, and from time to time a small quantity of fencing. Prices are firm at 2.75c on plain wire and 3.00c on nails, both base Pittsburgh.

New Business Only Fair

Chicago, Oct. 30.—The wire market is unchanged with prices at the same level and orders in fair volume. Local interests have not heard of the Japanese government inquiry for 3000 tons of wire nails, as export business is handled in the East. No great improvement is looked for until after inventory time.

Warehouse Trade Assisted by Mild Weather

WAREHOUSE PRICES, PAGE 1260

New York, Oct. 30.—Continued weakness in black and galvanized sheets features an otherwise strong warehouse market. Galvanized sheets are now obtainable at as low as 5.50c and black 4.60c, these materials being carried in the hands of many small jobbers who are competing strongly for business. Blue annealed sheets are not so widely held and are quoted firmly at 4.59c. The month now closing shows a substantial improvement over business in September. Shapes and bars are in especially good demand.

Prices Adjusted Downward

Philadelphia, Oct. 30.—Warehouse prices were adjusted downward last week and are now based on freight rates from Pittsburgh to Philadelphia. Demand for iron and steel products cut of stock is maintained at about 70 per cent of average.

Jobbers Cut Sheet Prices

Chicago, Oct. 30.—Warehouses which have been losing business in sheets to small jobbers and certain mills through shading of prices by the latter have slashed their quotations on blue and black sheets $7 per ton and on galvanized sheets $10. These reductions have stimulated business or brought back to the warehouses their share of this business, it is claimed. The Chicago warehouse quotations now are 4.00c for blue, 4.85c for black and 5.85c for galvanized, with the customary increases in St. Paul and St. Louis.

Bar Deliveries Are Better

While Some Centers Find Buying Increasing, Production Still Is Greater Than Bookings—Mills Are Curtailing Operation

BAR PRICES, PAGE 1205

Chicago, Oct. 30.—In flush times the increase in demand for soft steel bars the past week would go unnoticed but it has heartened producers somewhat. One interest finds its sales last week were double those of the previous week. Another interest asserts that users' stocks have reached the low point where fill-in material is urgently needed. But while this urgent requirement is being filled no future buying is being done. The improvement has been slight but at any event is welcome. Shipments continue to exceed new business. In bars as in other finished material urgent needs can be slipped into schedules almost anywhere. The soft steel bar price remains 2.60c, Chicago mill.

The bar iron market continues listless and the orders are small. The East Chicago mill is operating one turn. The quotation is unchanged at 2.40c, Chicago.

Business in rail steel bars is holding its own, with specifications light. The backlog of the Moline mill, which resumed operations a month ago, is down to two weeks, or about half its size when the mill was started. The rail steel bar price is 2.30c, mill.

Outside the strictly grain territory implement manufacturers have experienced improved buying. Exports, principally to France and South America, also are enlarged.

Eastern Demand Is Better

Philadelphia, Oct. 30.—Demand for steel bars has been better the past week. Several round tonnages and numerous small lots have been closed in that period. The price of 2.40c, Pittsburgh or 2.72c, Philadelphia, is well maintained.

Orders Frequent but Small

Pittsburgh, Oct. 30.—Frequent orders for merchant steel bars are noted as users know they now can obtain prompt delivery from a number of sources. Expecting lower prices they will not buy more than they need. Prompt deliveries are obtainable from large producers who a few weeks ago were two or three months behind on orders. Certain sizes are being delivered within two weeks and others are delivered during the same week the order is given. An order taken by a large interest here for 250 tons of 2¼-inch rounds early last week was on the rolls by Friday and while the order may have been timely and probably fitted in well with the rolling schedule for that particular mill, this circumstance is more or less typical. The Carnegie Steel Co. has taken off the 11 p. m. and 7 a. m. shift at one of its merchant bar mills, and other producers are reducing operation. Customers while under contract to take as much as they did in September, and in some cases more, are not so liberal with specifications as might be expected and various makers lack business. Everywhere the trade expects November will register a gain over the October although some believe the policy generally prevailing of cutting down inventories may hold shipments to the same rate as October. Prices are unchanged at 2.40c, base Pittsburgh. Refined iron still is quoted at 3.25c to 5.00c, base Pittsburgh, depending upon the degree of refinement. Demand is slightly improved.

Better Tonnages Coming Out

Cleveland, Oct. 30.—Individual orders for steel bars are larger but the number is not materially increased. The total tonnage placed this month is considerably in excess of that of September. Negotiations for a number of good sized lots are going on and some were closed this week. A railway specialty manufacturer in northern Ohio placed 1000 to 1200 tons additional. Another buyer is negotiating for 1800 tons of miscellaneous forms for shipment during the next three months. The inquiry reported last week for 2000 tons of carbon and special spring steel still is pending. Nut and bolt manufacturers are taking more steel. Practically all the mills now are making easier deliveries but no deviations from the price of 2.40c, Pittsburgh, are reported in this territory. While 3.15c more generally is the open price on hoops, recent concessions from this figure have been so numerous that the real market at present is in doubt. In some cases considerably below 3.00c, Pittsburgh, has been done, notably on light gages.

Cold Drawn Market Sensitive

Pittsburgh, Oct. 30.—The cold-drawn steel bar market is colorless but sensitive. Few new inquiries are developing and no large orders have been placed except one for 450 to 500 tons by a Detroit automotive interest with a local mill. This tonnage, while not large, developed 3.00c, base Pittsburgh. On the majority of orders 3.25c, as on contracts, is the ruling figure. The market is sensitive as no large stocks lie between mills and the ultimate consumer and the appearance of a fair sized order is immediately reflected in mill activity. While some have backlogs sufficient to last several weeks, others have only one or two weeks' business ahead. The general operation is between 60 and 70 per cent although some are able to operate as high as 80 or 85 per cent. Automotive lines have been specifying heavily, in some cases to the end of the year. Buyers generally are not yet ready to talk 1924 business.

Better Bolt, Nut Orders Appear in East

NUT AND BOLT PRICES, PAGE 1264

Pittsburgh, Oct. 30.—An improvement in orders is noted by the nut, bolt and rivet industry the past week or 10 days. So far this has been slight and represents betterment in the aggregate rather than in individual orders. At best business is spasmodic and from a wide territory. Railroads have been good buyers but jobbers, active in September, withhold further business, their stocks being well balanced and sufficiently large to meet current demand. Prices continue weak and concessions of an extra 5 or even 10 per cent appear from time to time on attractive business where competition is keen. The regular market on large machine bolts, however, remains quotably unchanged at 60 and 5 off. Occasional orders for single carloads are noted. The same condition applies to rivets, quoted regularly at 3.00c, although as low as 2.75c, base Pittsburgh, appears from time to time.

Specifications Still Lag

Chicago, Oct. 30.—Makers of bolts and nuts find no improvement. Users are taking business constantly, but only for immediate requirements. Makers do not look for an upturn until the general steel situation becomes brighter.

Coopers Buying Hoops

HOOP PRICES, PAGE 1205

Pittsburgh, Oct. 30.—Appearance of cooperage business, the first in a long period, gives encouragement to hoop and bandmakers Buying by the automotive industry continues of fair proportions but the general stamping business is small. Buyers are not closing on large tonnages but are confining their purchases to prompt needs, as for some time. Hoops and bands generally are quoted at 3.00c to 3.15c, with some makers quoting 3.30c, while on extremely narrow and light gages as high as 3.50c, and even 3.75c, appear from time to time. No stocks are being carried, which is looked on as a favorable indication that considerable business will come out soon.

Seek More Uses For Cold Rolled Strip

Pittsburgh, Oct. 30—Considerable discussion was devoted to the matter of increasing cold-rolled strip steel consumption at a meeting of 35 manufacturers of that material held at the Waldorf-Astoria hotel, New York, Oct. 24. The attendance represented 98 per cent of the entire production of cold strip in the United States. The meeting was in charge of E. W. Harrison, Philadelphia, chairman, and Charles M. Best, Pittsburgh, secretary.

Many new uses for cold-rolled strip steel have been found, one of which is its substitution for lumber, thereby conserving forest timber. A large tonnage is now being consumed in the manufacture of furniture. The suggestion that meetings be held quarterly was unanimously favored and since the majority of strip steel manufacturers attend the American Iron and Steel institute meetings it was decided to hold a quarterly meeting immediately before or after each institute meeting. Each manufacturer

pledged entire co-operation in devising ways and means for disposing of surplus production.

Attention was called to the increased cost of production through the establishment of the 8-hour day basis. Apparently no relief is in sight. A canvass showed export business in cold-rolled strip steel is less than 1 per cent of production.

Bethlehem Steel Orders Showing a Gain

A noticeable increase in new business was reported by H. E. Lewis, vice president of the Bethlehem Steel Corp., following the recent meeting of the board of directors of the company. New orders are particularly good from the railroads which are buying rails and accessories in large quantities, according to Mr. Lewis. A good time is evident in tin plate, sheets and wire with structural operations higher. The company's steel plants now are operating at 75 per cent of capacity.

The earnings statement of Bethlehem for the third quarter shows net profits of $10,518,951 against $11,601,682 in the preceding quarter. After allowing for all charges, including reserves for depreciation and other charges, there was reported net income of $4,400,603 available for dividends on the preferred and common stocks, against $5,426,471 in the previous quarter.

The value of unfilled orders carried on the books of the company on Sept. 30, 1923 was reported as $53,134,000 against $80,066,000 on June 30.

The detailed income account for the September quarter as compared with the June quarter follows:

	Sept. 30, 1923	June 30, 1923
Total net earnings.....	$10,518,951	$11,601,682
Interest, other charges.	3,197,837	3,245,082
Balance	$7,321,114	$8,356,600
Depreciation, etc.....	2,920,511	2,930,129
Net income.....	$4,400,603	$5,426,471
Preferred dividends.....	1,080,207	1,079,851
Common dividends.....	2,245,741	2,244,358
Total dividends.....	$3,325,948	$3,324,209
Surplus	$1,074,655	$2,012,262

The mill at Sparrows Point, Md., is again resuming the rolling of rails after being shut down since April, 1919. Mr. Lewis said that the capacity of this plant would be increased ultimately, but not in the immediate future. The Lackawanna property acquired by Bethlehem about a year ago, is showing up satisfactorily, he said. Charles M. Schwab, chairman of the board, when questioned as to new financing, said the company did not contemplate the sale of new securities in any form.

Machinery President Dies

E. E. Strong, president of Strong, Carlisle & Hammond Co., Cleveland, manufacturer of machinery, mill and factory supplies, and first president of the National Supply & Machinery Dealers' association, died at his home in that city, Oct. 29. A more complete account of his life will be given in IRON TRADE REVIEW, Nov. 8.

Interest in Plates Subsides

New Orders and Inquiries of Light Character—Some Government Barge Work Pending—Railroad Car Business Still Awaited

PLATE PRICES, PAGE 1205

Pittsburgh, Oct. 30.—The majority of plate inquiries before the trade call for less than 1000 tons each. Those for 750 to 1000 tons are scarce. The usual specification is for 50 to 200 tons. One lot for miscellaneous tank work for a Texas oil field, ordered through the Dallas, Tex., office of the Pittsburgh-Des Moines Steel Co., Pittsburgh, is for 100 tons. This interest's Des Moines office has received an inquiry from the Cotton Belt Oil Co. for five 55,000-barrel tanks involving approximately 750 tons of plates. The Phoenix Iron Works Co. recently issued an inquiry for 200 tons. Orders for fifteen 55,000-barrel tanks for a southeast oil field recently were distributed among three tank builders who could supply them immediately from stock. Several inquiries involving a large aggregate are out for gas holders for various centers. Barge work, except for three lots for the United States government, is scarce. The three lots call for 20, seven and three barges, the largest for Louisville, Ky., bids on which close Nov. 23. Boiler plate work is limited. The price remains firm at 2.50c, base Pittsburgh, as far as the local market is concerned.

Inquiry Is at Low Ebb

Chicago, Oct. 30.—Most of the new business in plates hovers around the 40 and 50-ton mark. Platemakers, however, will be disappointed if the prospective railroad freight car buying does not develop heavy orders for the first half. Practically no oil storage tanks have been placed in the last few days. The level of 2.60c, Chicago, is being adhered to.

The village of New Holstein, Wis., is taking bids until Dec. 18 on an 80,000-gallon tank, involving about 250 tons of plates.

Interest in Railroad Business

New York, Oct. 30.—Interest in the plate market continues centered in the heavy tonnages involved in railroad business now under negotiation. There is no indication as to when orders will be placed. New locomotive contracts booked by the American Locomotive Co. involve a fair amount of plate tonnage. Otherwise, the market lacks large lots and generally the situation is unchanged. The market continues 2.40c to 2.50c base Pittsburgh.

The Brooklyn elevated line is inquiring for 200 tons of plates.

No Impetus Yet in Sight

Birmingham, Oct. 29.—With pig iron prices lower than in many months it was expected buying would be revived but this has not followed. Prices at $22 at home and $20 or lower in competitive territory has brought small buying, most sales being hand-to-mouth. Production excceds shipments and melt, though sales now are nearing total output. Some inquiry has been received for 1924 but no sales have been made except for small lots. Sellers are holding off on first quarter sales, because of the present price. The Gulf States Steel Co. will blow in its blast furnace stack this week after repairs and start production from three open-hearth furnaces.

More Vessels Being Bid

Cleveland, Oct. 30.—Some new inquiries for freight vessels have come before lake shipyards the past week and at least three to four boats requiring 15,000 to 20,000 tons of steel may be placed soon. A recent estimate put the number of boats recently closed or now pending on the lakes as nine. Miscellaneous orders for plates do not appear as large as recently. Buyers still are following a cautious policy and are closing in a hand-to-mouth fashion. Prices show even strength at 2.50c, Pittsburgh. A considerable tonnage is represented by pending locomotives orders upon which builders in this district are figuring.

Eastern Demand Small

Philadelphia, Oct. 30.—Plate demand in the East continues small so that the mills in this section are just about able to maintain the present reduced rate of operations. All buying is on a hand-to-mouth basis. Some producers report an increased percentage of business going at 2.40c, Pittsburgh or 2.72c, Philadelphia, instead of 2.50c, Pittsburgh. The latter price, however, continues to be well maintained by the larger maker.It is reported that some further shipbuilding contracts which have bee under negotiation with eastern yards notably one for the Clyde Steamship Co. may be placed soon.

Talk on Standardization

Col. E. C. Peck, works manager of the Cleveland Twist Drill Co., Cleveland, delivered an address on standardization at the opening meeting in observance of "management week," at the Hotel Winton, Cleveland, Oct. 24. He stressed the fact that the adoption of standardization principles is not necessarily an expensive and wasteful process as is commonly supposed, but on the contrary is a gradual replacement of old methods by new ones. According to the speaker the first application of the standardization principle to manufacturing was developed in the early nineteenth century by Eli Whitney who produced rifles with interchangeable parts. Ambrose Swasey, Warner & Swasey Co., Cleveland, in commenting on Col. Peck's remarks, said he believes the micrometer has been the greatest single agent in the process of standardization.

Embassy Takes Bids

Washington, Oct. 30.—The Japanese embassy is receiving bids until Nov. 1 for the 20,000 tons of sheets and 3000 tons of nails for reconstruction work in Japan.

Concrete Demand Lighter

Jobs Involving Small Tonnages Form Majority of Activity in Reinforcing Bar Market—Little Weakness in Prices Evidenced

REINFORCING BAR PRICES, PAGE 1205

New York, Oct. 30.—Buying of concrete reinforcing bars continues of slender proportions here and new inquiry is dull. The largest job now pending involves 1000 tons for the plant of the Western Electric Co., Kearny, N. J. Prices are unchanged. The mill price generally is firm at 2.40c, base Pittsburgh, and concessions from this figure apparently apply to odds and ends and hard bars. On shipment out of Pittsburgh warehouse stocks the market is 2.50c to 2.65c, base Pittsburgh, while for shipment out of New York stocks the usual price is 2.75c, base Pittsburgh.

Small Tonnages Placed

Cleveland, Oct. 30.—Demand for reinforcing bars in the territory continues to be comprised mainly of jobs requiring small tonnages. Several good-sized projects are pending now, but no further large business is expected to reach the award stage for several months, most of the rumored sizable jobs being for spring delivery. Most dealers report sufficient small orders to maintain a good percentage of normal activity. Prices are firm at 2.75c, Pittsburgh, for goods out of stock, although a few jobbers still are unloading. New steel bars are firm at 2.40c, Pittsburgh, while from 2.15c to 2.25c still is done on rerolled.

Sales Continue in Small Lots

Detroit, Oct. 30.—Movement of reinforcing bars continues of small volume in this district. Distributors say that not more than 1000 tons were sold in this vicinity last week. No large tonnage is in sight, although several large construction jobs are considered, as nothing definite has been done on them. The bulk of sales in recent weeks has been on small construction work and additions to buildings. The new addition to the Towson Body Co.'s plant will take about 300 tons of bars. No change in prices is noted. Liberal road construction work planned in southern Michigan by the state highway department will call for large tonnage.

Jobs Numerous but Small

Chicago, Oct. 30.—Business in reinforcing concrete bars continues mainly in small lots, under 50 tons each, with larger jobs becoming scarcer as cold weather approaches. Competition for the 800 tons to go into the Knights of Columbus club house, Chicago, has been narrowed by a redesign of the plans to the Concrete Steel Co. and the Kalman Steel Co. Rail steel bars probably will be used in the Vassar Swiss Underwear Co. building, for which 150 tons are required. The 800 tons for the McCormick road, which will be awarded in a day or two, doubtless will go to a mill. Order books of the various bar interests here are replete with small jobs and no complaint is voiced concerning the aggregate of business. The reinforcing bar price continues to hold at 2.75c, Chicago warehouse.

Activity Exceedingly Limited

Pittsburgh, Oct. 30.—Concrete bar activity this past week has been exceedingly limited. No inquiries of size have come out and orders have all been for less-than-carload lots, usually 15 to 25 tons apiece. A West Virginia job to be placed shortly calls for 100 tons and the bars for the local schools, Boggs avenue elementary and South Hills high, about 275 tons, as well as the Sharpsburg shops of the Pennsylvania railroad are yet to be placed by the general contractors, as noted last week. Concrete bars still are quoted at 2.40c to 2.50c, base Pittsburgh.

CONCRETE CONTRACTS PLACED

Awards this week	**1,227 tons**
Awards last week	**500 tons**
Awards two weeks ago	**8,831 tons**

300 tons, Taft Realty building, Hollywood, Cal., to unknown fabricator.
223 tons, Part-time high school, Los Angeles, to unknown fabricator.
200 tons, waterworks at Blairstown, O., to Concrete Steel Co.
160 tons, Capitol theater, Chicago, to Concrete Engineering Co.
125 tons, Illinois Central Forty-first street viaduct, Chicago, to Concrete Engineering Co.
110 tons, Masonic hall at Ponca City, Okla., to Concrete Steel Co.
109 tons, monastery at Boston, to Concrete Steel Co.

CONCRETE CONTRACTS PENDING

2000 tons, administration building for filtration plant of Baldwin reservoir, Cleveland; Stange-Walsh Construction Co. low bidder.
1200 tons, 800 tons for Burnside street and 400 tons for Ross Island bridges, Portland, Oreg.; 125 tons up for active bids.
1000 tons, plant of Western Electric Co., Kearny, N. J.; general contract to Turner Construction Co.
200 tons, Shrine temple, Fort Wayne, Ind.; bids in.
200 tons, 122nd Regiment Field Artillery armory, Chicago; refigured bids in.
Tonnage not stated, 3-story plant for Grand Rapids Showcase Co., Portland, Oreg.; general contract let.

Pipe Mill

Operations Continue Well Over 90 Per Cent With Bookings Light

PIPE PRICES, PAGE 1205 AND 1264

Pittsburgh, Oct. 30.—Operations among the various pipe mills in this and in the Ohio and West Virginia territories as well as points further west are maintained at the relatively high average of 90 to 95 per cent. This represents more of an accumulation of small orders involving one, two or three carloads at a time rather than any large-tonnage single orders. Buttweld sizes of standard full weight merchant pipe still are in popular demand and jobbers everywhere are calling for deliveries of certain sizes to round out their stocks or to supply their customers' immediate needs. Occasional orders for lapweld also are noted and the recently developed improvement in demand from the oil fields for gas well drilling continues in an even more manifest way. Ohio, West Virginia and Pennsylvania gas companies all are calling for larger and more frequent shipments, the major portion of their attention being devoted to gas well boring and drilling now that the rates on domestic gas have been increased. Price cards of April 19, 1923 hold firm.

Municipal Work Still Up

New York, Oct. 30.—Bids will be closed today on 350 tons of 6 to 8-inch cast iron pipe for Katonah, N. Y., and Nov. 1 on 350 tons of 6 to 16-inch pipe for Jamestown, N. Y. Little else in the way of municipal inquiry is noted. The local department of water, gas and electricity has allocated 5000 tons of pipe and fittings between the United States Cast Iron Pipe & Foundry Co., Donaldson Iron Co., and R. D. Wood & Co.

Seasonal Dip Still Slight

Chicago, Oct. 30.—Cast iron pipe makers report business is holding up well and not falling off so much as might be expected at this season. Award is expected shortly of 570 tons for the city of Chicago, which will probably go to the United States Cast Iron Pipe Co. or the American Cast Iron Pipe Co. The largest job current is one at Tulsa, Okla., for which bids now are in, totaling more than 4000 tons. The market is at $49, Birmingham or $57.20, delivered Chicago, for 6-inch and over.

Plants Keep Busy

Birmingham, Ala., Oct. 29.—Cast iron pipe plants in this district are operating at capacity, many orders still coming in to be filled. Specifications are numerous. While pig iron prices have been reduced, pipemakers are receiving some of their material at old prices. Some concessions still are being made on the quotations which are being given out. The Far West and Northwest still are buying pipe.

CAST IRON PIPE PLACED

5000 tons, department of water, gas and electricity, New York, allocated between United States Cast Iron Pipe & Foundry Co., the Donaldson Iron Co. and R. D. Wood & Co.
2800 tons, work in Denver, to United States Cast Iron Pipe & Foundry Co.
550 tons, 4 and 6-inch class B pipe for Beverly Hills, Cal., to McWane Cast Iron Pipe Co., announced last week as 60,000 feet.
500 tons, 4, 6 and 24-inch class B pipe for Los Angeles, to National Cast Iron Pipe Co.
250 tons, 6-inch pipe for East Bay Water Co., Oakland, Cal., to McWane Cast Iron Pipe Co.

CAST IRON PIPE PENDING

30,000 feet, 4, 6 and 8-inch pipe, work for New Holstein, Wis.; bids taken until Dec. 18 by Louis Hipke.
4000 tons, Tulsa, Okla.; bids in.
1052 tons, 3, 6, 8, 10 and 12-inch class B pipe for San Diego, Cal.; United States Cast Iron Pipe & Foundry Co. low bidder.
570 tons, Chicago; bids in.
450 tons, 6, 8 and 10-inch class C pipe for Los Angeles harbor commission; bids in.
350 tons, 6 to 8-inch pipe, Katonah, N. Y.; bids in.
350 tons, 6 to 16-inch pipe, Jamestown, N. Y.; bids closed Nov. 1.
200 tons, Joliet, Ill.; bids in.
100 tons, Duluth, Minn.; bids in.

Strip Trend Is Favorable

STRIP PRICES, PAGE 1205

Pittsburgh, Oct. 30.—Favorable trends are slowly developing in the hot and cold-rolled strip steel market. Business is coming in fair volume although it mostly is piecemeal. Users everywhere are not specifying future needs although the prompt requirements of some necessarily

involve large tonnages. Few contracts are on the books for delivery over the remainder of the year and buying rarely is for shipment beyond 30 days ahead. It is claimed by producers here that this rate of buying creates a fairly satisfactory basis on which to work since it demonstrates that stocks in hands of consumers are not heavy in any direction. Expected improvement in consumption will immediately be reflected in mill operation and production. Prices generally are recognized as fair among the buyers and while occasionally concessions in hot strips are available the market is quotable at 3.00c to 3.15c, base Pittsburgh, with co'd strips holding firmly to the 5.00c base Pittsburgh level. Business is coming in from different consuming lines, the largest user still being the automotive industry.

Tin Plate Orders

Continue Heavy—One Can Manufacturer Places 100,000 Boxes

TIN PLATE PRICES, PAGE 1205

Pittsburgh, Oct. 30.—The American Sheet & Tin Plate Co. has just accepted an order for 100,000 base boxes of tin plate for general can manufacture, to be delivered in December. The customer would specify 200,000 additional boxes if assured of delivery in that month. It has been the usual experience of tin plate producers that customers want shipment deferred from December to shortly after Jan. 1, to cut down inventories. This lot with other business in hand and coming in from week to week to the leading interest assures it of operating schedules 90 per cent or higher until the end of the year. In the past week it operated 91.2 per cent of tin mills, the highest rate so far this year. With the addition of another double mill at Gary this week it may achieve a schedule 2 per cent higher, although due to engine trouble at another mill it is possible the figure for the week will be approximately the same as last. Independents also are enjoying a good demand for tin plate, and the general average is somewhere around 95 per cent. Several anticipate further business from oil companies as these are expected to turn their attention to case oil business. Announcement of a price on tin plate for the first quarter of next year is deferred for a week or two. The market price is unchanged at $5.50 per base box of 100 pounds, Pittsburgh.

Price Advance Rumored

Youngstown, O., Oct. 30.—With the 8-hour day increasing costs in the production of semifinished material, it is rumored that an advance of 25 cents per base box above the current price of tin plate is not far distant. Sufficient business is in the hands of producers to warrant attractive operation until the end of this year, indications pointing to a good volume of business for production next quarter. Quotations remain unchanged at $5.50 per base box, Pittsburgh.

The Air Reduction Co., New York, reports net profits for the three months ended Sept. 30 of $655,703, before federal taxes, compared with $728,458 in the preceding quarter and $181,311 in the corresponding quarter of 1922.

Japan Buying More Sheets

Valley Mills Booked to Limit with Gages Suitable for Overseas Account—Domestic Demand for Best Grades Increases

SHEET PRICES, PAGE 1205

Pittsburgh, Oct. 30.—Additional sheet business has been placed and more is expected this week for reconstruction work in Japan. One interest booked slightly less than 20,000 tons of black sheets in the past week for Japan, and an inquiry from the Japanese government received from the embassy at Washington calls for 19,000 to 20,000 tons more. Now that Japan apparently is willing to take 30-gage and heavier material, foregoing its policy of buying only 30½ and 31-gage sheets, its business is more attractive to American sheet makers. This is particularly true since the prices obtainable abroad are somewhat better than those on domestic business at the same market bases, 3.85c and 5.00c, base Pittsburgh, on black and galvanized, respectively. Quotations from at least one source, that of a sheet maker which recently started up new mills are $2 to $3 below these levels, 3.70c and 4.85c having been named on small lots of black and galvanized sheets. One or two other makers are quoting 3.75c and 4.90c, base Pittsburgh, respectively. Blue annealed remains firm at 3.00c, base Pittsburgh, although some resale sheets are reported to be offered here at 2.75c, base Pittsburgh, by a middle interest. It is understood that these sheets were received in a trade for scrap. In the full-finished sheet market demand is good, with few suspensions. While one or two automobile companies or makers of automobile parts have asked that shipments be held up for a short time, two or three others are urging that shipments be expedited to aid them with increased schedules. While the general sheet mill operating average is around 80 per cent, the American Sheet & Tin Plate Co. operated 86.2 per cent of its sheet mills last week, having a general hot mill average of 89 per cent. Its customers in diversified lines are specifying tonnage liberally.

Booked Up on Japanese Orders

Youngstown, O., Oct. 30.—Many producers of sheets in this district have booked about as much 28 and 30-gage tonnage for Japan as will balance with domestic business in hand. In some instances the bookings of black sheets in this direction are well above 8000 to 10,000 tons, while in other cases they have not exceeded 600 to 3000 tons. One producer is understood to have been offered all the 30-gage tonnage he would take by commission houses representing Japanese interests, but the tonnage accepted was comparatively small. On Japanese orders for 30-gage black sheets placed in the valley the full net price of 4.60c, Pittsburgh, is understood to have been obtained. An inquiry for 20,000 tons of this grade from the Japanese government is expected this week by certain producers, but it is unlikely that much tonnage will be accepted in view of the lack of domestic specifications which would permit the scheduling of the size and gage desired. Inquiry for all grades of common sheets continues light throughout this district. The majority of producers are quoting 3.85c, Pittsburgh, on black, although they continue to hear of offers at 3.75c. Current production represents contract tonnages taken a few weeks ago at the full price. Demand for galvanized is light. While a price of 4.90c, Pittsburgh, has been encountered in some districts, producers here continue to maintain the 5.00c quotation. A check-up of the Detroit district reveals that several large plants supplying parts for automobile builders, have sufficient tonnages of sheets either in stock or on contract to cover their requirements during this quarter. This class of consumers, however, report contracts for the first quarter of next year are beginning to appear and that indications point to better business within the next few weeks. Demand for high-grade sheets from some of the large automobile producers shows slightly more activity. A number of consumers are pressing for delivery of automobile sheets that can be worked into December car schedules and for this reason better sentiment prevails. Fine finished sheets continue to be quoted at 5.35c, Pittsburgh, for No. 22 gage.

More Japanese Business Taken

Chicago, Oct. 30.—A local mill has taken about 2000 tons of black sheets for shipment to Japan in December. The mills have received the inquiry of the Japanese government direct, which calls for 13,000 tons of black, 3500 tons of plain galvanized and 3500 tons of corrugated galvanized, all 28 and 30 gage. It seems doubtful whether much more Japanese sheet business will be taken by local makers. Sheet mills are reasonably booked for the remainder of the quarter, but their schedules are such that they can slip in prompt tonnages whenever buyers insist. The leading makers are adhering to the level of 3.00c, Pittsburgh, for blue, 3.85c for black and 5.00c for galvanized. New business in sheets has been quickened slightly in the past week but orders taken have been uniformly small. The local warehouses have reduced their prices on galvanized and No. 28 black sheets $10 per ton and on blue sheets $7 per ton. These reductions were prompted by the undercutting of the smaller jobbers. The warehouses report their slashing of prices has had the desired effect of materially increasing their orders.

Eastern Mills Need Tonnage

Philadelphia, Oct. 30.—In the sheet market blue annealed continues to be the firmest commodity, anything under 3.00c, Pittsburgh, or 3.32c, Philadelphia, being exceptional. Most mills continue to quote 3.85c, Pittsburgh, on black, but it is easy to buy at 3.75c, and the latter figure has been shaded. Mills quote 5.00c on galvanized, but some sales have been made at less. Makers are beginning to need additional business to maintain schedules.

Structural Buying Better

Building Activities Continue Unchecked In Normally Off Season—Two New York Lofts Totaling 9000 Tons Come Out During Week

STRUCTURAL SHAPE PRICES, PAGE 1205

New York, Oct. 30.—Specifications continue to come out freely in the local structural market, particularly for lofts and apartments. Steel for office buildings is relatively not much in demand at the moment. Little new inquiry is out for schools, although a substantial tonnage is actively being figured, and considerable of this work is in prospect.

The present program calls for the issuance of specifications for 32 schools in greater New York over the next five months. These schools will range from approximately 700 to 3000 tons each and will average around 1500 tons apiece, or close to 50,000 tons in the aggregate. Some doubt is expressed over this program going ahead as rapidly as now scheduled, reference being made to delays in this work over the past couple of years. An outstanding award is that of 3000 tons for the Baltimore & Ohio piers, Baltimore.

The shape market is unchanged, with the larger producers still quoting firmly at 2.50c, Pittsburgh, and continued shading on the part of a couple of the smaller mills. Quotations on fabricated material are firm.

Betterment Slow In Developing

Pittsburgh, Oct. 30.—Betterment in structural shape demand is not developing as fast as some would like although confidence is expressed throughout the trade that before the end of the year signs of that character will be unmistakeable. Small orders rule and inquiries involving large tonnages continue to be withheld. The Independent Bridge Co. received a 275-ton bridge order for local installation and with several other fabricators, report an accumulation of 15, 20 and 25-ton lots, with an occasional 50-ton award Several development projects are scheduled for the Pittsburgh area but some of these will be postponed until spring. Fabricators report that so far they have failed to realize success in their efforts to develop a quotation lower than 2.50c, base Pittsburgh, although according to some of the bids being filed on material fabricated and erected some evidently are figuring their plain material price at a level less than 2.50c.

Large Work Delayed

Boston, Oct. 30.—Many large building projects which have been before the fabricators for several weeks are still held up and awards of the past week have been mostly in lots of from 30 to 100 tons each. Despite this fact the total tonnage is well maintained and the market is active. The price on plain shapes is 2.40c, Pittsburgh. Scarcely any tonnage has been placed either above or below this figure. Plates are held by several of the makers at 2.50c and the 2.40c price is difficult to obtain for prompt delivery.

Lettings Large; Prospects Good

Chicago, Oct. 30.—Not in many weeks have structural lettings totaled so large a tonnage as they have this past week in Chicago. An unusually large number of projects is on architects' boards. Bids for the new Palmer house, which should require from 12,000 to 15,000 tons, probably will be taken about Jan. 1. A half dozen projects entailing expenditures of from $1,000,000 to $1,500,000 are getting to the place where bids may be taken in 60 days. October building permits up to last Saturday totaled almost $33,000,000, making the total for the year to date over $277,000,000, compared with $227,700,000 for all of 1922. The structural shape price is unchanged at 2.70c, Chicago.

Small Lots Constitute Market

Cleveland, Oct. 30.—Lettings and inquiries in the structural steel market here are confined to lots of from 50 to 100 tons, with few orders mounting above the latter figure. Large projects still are pending, but action on closing is being deferred. Among the outstanding awards is that of 350 tons for the Toledo safety building, Toledo, O., to the Donovan Wire & Iron Co. Local interest centers in the award of the Brotherhood of Locomotive Engineers bank building on which steel estimates run from 5000 to 6300 tons. The general contract, although reported awarded to George A. Fuller Construction Co., has not been placed. Plain material prices are firmly held at 2.50c Pittsburgh.

Some Material Booked

Buffalo, Oct. 30.—Some structural shape contracts are being placed. On the 1000-ton inquiry for an office building noted last week, 400 tons have been booked with an independent fabricator. The remainder of the inquiry is still in abeyance. Prices are unchanged from levels prevailing for some time past in this market.

Bookings Equal Shipments

Philadelphia, Oct. 30.—Structural shape demand reflects considerable activity and the mills report that their new bookings practically are equaling shipments.. Current operations of eastern mills are averaging around 70 per cent of capacity. The range of prices continues from 2.40c to 2.50c, equivalent to 2.72c to 2.82c, delivered Philadelphia On some business, eastern mill prices are being quoted. No new lettings of size are reported although several of importance are being actively figured.

Little Activity Noted

Cincinnati, Oct. 30. — Structural awards again passed a week of little activity after showing a gain during the previous period Practically the only award in this immediate territory was 1250 tons for bridge work of the Louisville & Nashville railroad, this tonnage being divided between three makers. New inquiries for the week were few and for small lots. The Big Four railroad has taken bids on bridge work involving about 800 tons. Prices still hold firm.

STRUCTURAL CONTRACTS PLACED

Building awards this week.....14,375 tons
Building awards last week..... 10,642 tons
Building awards two weeks ago.... 18,839 tons

3000 tons, Baltimore & Ohio piers, Baltimore, to American Bridge Co.

2250 tons, plates for 15 55,000-barrel tanks distributed among two or three independent fabricators for erection in a southern oil field.

1250 tons, bridge work, Louisville & Nashville railroad, awarded as follows: Virginia Bridge & Iron Co., 800 tons; American Bridge Co., 300 tons and Louisville Bridge & Iron Co., 150 tons.

1100 tons, apartment hotel in West Seventieth street, New York, to Dreier Iron Works, which probably will sublet the fabrication.

1000 tons, Greenbaum loft building, Thirty-eighth street, New York; to Levering & Garrigues.

965 tons, tipple, Buckeye Coal Co., Nemacolin, Pa., to John Eichleay Jr. Co.

750 tons, plates, for five 55,000-barrel tanks for the Cotton Belt Oil Co., through Des Moines, Iowa, office of the Pittsburgh-Des Moines Steel Co.

612 tons, Mercy high school, 8130 South Prairie avenue, Chicago, to American Bridge Co.

600 tons, Baltimore News & American building, Baltimore, to Dietrich Bros.

550 tons, work for Standard Sanitary Mfg. Co. at Tiffin, O., to McClintic-Marshall Co.

500 tons, power plant, Weymouth, Mass., to independent fabricator.

470 tons, washery at Rosita, Mexico, to United States Steel Products Co.

438 tons, Snake river bridge, Ontario, Oreg., to Minneapolis Steel & Machinery Co.

400 tons, building for Vanderbilt University, Nashville, Tenn., to unnamed fabricators.

400 tons, bridge repairs for New York, New Haven & Hartford, at Boston, to American Bridge Co.

400 tons, office building, Buffalo, N. Y., to independent fabricator.

350 tons, Toledo Safety building, Toledo, O., to Donovan Wire & Iron Co.

349 tons, eleven spans for Missouri-Pacific railroad, to American Bridge Co.

300 tons, Y. M. C. A. building, San Diego, Cal., to Minneapolis Steel & Machinery Co.

300 tons, Childs restaurant, Coney Island, New York, to Levering & Garrigues.

293 tons, Knights of Columbus building, Springfield, Ill., to St. Louis Structural Steel Co.

275 tons, Penn avenue bridge over the Pennsylvania railroad, to Independent Bridge Co.

250 tons, box girders for crane bridges, Whiting Corp. to Bethlehem Steel Corp.

211 tons, compressor shed for Los Angeles harbor commission, to Austin Co. of California.

200 tons, telephone exchange at Portland, Me., to New England Structural Co.

170 tons, warehouse at Oakfield, N. Y., for United States Gypsum Co., to Pittsburgh Bridge & Iron Co.

133 tons, addition to building for Herbst Department store, Fargo, N. Dak., to St. Paul Foundry Co.

129 tons, Bull Run pipe line No. 3, Portland, Oreg., to Poole & McGonigle.

100 tons, addition to institute of the blind, New York; to Hay Foundry & Iron Works.

100 tons, pier shed for Los Angeles harbor commission, to Austin Co. of California.

STRUCTURAL CONTRACTS PENDING

4000 tons, loft at Thirty-fifth street and Seventh avenue, New York; Buchman-Kahn, architect taking general contractors' bids.

5000 tons, Leftcourt loft building,, New York; bids asked.

1800 tons, Burnside bridge at Portland, Oreg.;

1200 tons, job in Eastern Pennsylvania being sublet by the Mississippi Valley Structural Steel Co.; bids in.

1100 tons, Alexander hotel, Paterson, N. J.; up for new bids.

1000 tons, Knights of Columbus building, 843 Eighth avenue, New York; plans out soon.

900 tons, Cahn & McCabe building, Seventh and Spring streets, Los Angeles; bids being taken.

700 tons, office building near Forty-second street and Broadway, New York; pending.

700 tons, plates and shapes, gas holder for Honolulu, Hawaii; Cruse-Kemper Co., Ambler, Pa., engineer and contractor.

700 tons, addition to high school of commerce, San Francisco; bids in.

600 tons, administration building for filtration plant of Baldwin reservoir, Cleveland; Stange-Walsh Construction Co. low bidder.

540 tons, dormitory for Barnard college, New York; Thomas O'Reilly, general contractor.

500 tons, bridges for Norfolk & Western;

bids in.
500 tons, Y. M. H. A., Paterson, N. J.; pending.
468 tons, Old Oregon Trail bridge over Snake river, bids opened by State highway commission, Portland, Oreg.
400 tons, bridge at St. Paul for St. Paul Union Terminal railroad; bids in. Unconfirmed report states award to Milwaukee Bridge Co.
300 tons, apartment for Paterno interests, Eighty-third street and West End avenue, New York; bids to be asked soon.
300 tons, West Twenty-fifth street bridge, Union Terminal project, Cleveland; Richey Construction Co., general contractor.
200 tons, Staten Island bank, Stapleton, Staten Island, N. Y.; pending.
200 tons, Hillside birdge, Independence, O.; Standard Engineering Co., Toledo, O., general contractor.

Steel Corporation

Earnings Hold at High Level—Declare Extra Dividend

United States Steel Corporation net earnings in the third quarter of 1923, totaling $47,053,680 were but slightly below those of the second quarter amounting to $47,858,181 and much higher than the third quarter report of 1922 which showed a total of $27,468,339.

Judge E. H. Gary announced at the quarterly meeting in New York an extra dividend of ¼ per cent in addition to the regular 1¼ per cent quarterly dividend on common stock. The extra dividend will be deducted out of the surplus.

The declaration of the extra dividend is taken by observers to a reflect confidence by the Steel corporation in the future. Judge Gary stated that there was not enough business to keep all the works in full operation. New business is at the rate of about one-half the corporation's productive capacity but inquiries including requests for prices and shipments are large. He said that apparently a large amount of business would be actually contracted for in the near future as necessities are heavy and the ability of the buying public to pay for them is sufficient. He expressed himself as feeling comfortable regarding the future and offered the opinion that possible reparations negotiations will not affect the steel industry materially.

The third quarter financial report of the Steel corporation was as follows:

	Third Quarter 1923	Third Quarter 1922
July	$15,767,003	$ 9,833,664
August	16,997,467	10,615,085
September	14,289,210	7,019,590
Total quarter earnings after deducting operating and maintenance expenses and extimated taxes	47,053,680	27,468,339
Depreciation and sinking fund	13,127,769	11,170,945
Net income	33,925,911	16,297,394
Interest and bond premiums	4,917,976	4,978,296
Balance	29,007,935	11,319,098
Preferred dividend	6,304,919	6,304,919
Common dividend	6,353,781	6,353,781
For improvements or betterments	10,000,000	.....
Surplus	6,349,235	*1,339,602

*Deficit.

Plan for Japanese Trade

Washington, Oct. 30.—The department of commerce has asked the American Hardware Manufacturers association and other trade associations to meet here Nov. 2 to plan for Japanese business.

Car Inquiries Appear

Burlington Comes Into Market for 1000 Gondolas—Southern Pacific Closes on 43 Locomotives—Nickel Plate Buys 27,500 Tons of Rails

RAILROAD TRACK MATERIAL PRICES, PAGE 1205

Chicago, Oct. 30.—Total freight cars which the railroads are understood to be figuring on but for which they have not yet put out formal inquiry is estimated at 80,000. Quiet negotiation for part of these cars is being conducted but so far nothing definite has been announced. The belief is firmly held that the railroads will come out for approximately this number of cars for 1924 delivery and that action may be looked for in the immediate future.

Distribution of the Pennsylvania railroad's requirements of 200,000 tons is expected this week. The leading interest continues to quote light rails at 2.25c but is compelled to shade this to get its share of the small volume of buying.

The Chesapeake & Ohio railroad is reported to have divided about 17,000 tons of tie plates between the Wheeling Steel Corp. and the Bethlehem Steel Corp. The Union Pacific has purchased 2500 tons of tie plates in this district. The 70,000, kegs of spikes, 30,000 kegs of bolts and 18,000 tons of tie plates which last week were reported before local makers still are hanging fire. It is believed that the Chesapeake & Ohio's tie plates were not included in the above total. These track fastenings are near the point of placement.

Buying in Progress

Boston, Oct. 30.—The New England railroads are in the midst of buying for first half requirements of rails and fastenings. A total of 21,000 tons of standard tee rails have been placed during the week and inquiry for 4000 tons of girder rails is before the trade. The Boston & Albany railroad placed about a thousand tons of bolts and fastenings.

Nickel Plate Placing Rails

Cleveland, Oct. 30.—Distribution of 27,500 tons of rails for 1924 delivery for the Nickel Plate system is being made. The order involves 17,500 tons for the Nickel Plate proper and the Lake Erie & Western and 10,000 tons for the Clover Leaf. The business was split up among various mills. This system is expected to place a considerable tonnage of track material soon.

Buying Rate Spasmodic

Pittsburgh, Oct. 30.—Spasmodic buying of light rails alone is noted, a carload or two at a time. Specifications coming to large producers are in some cases heavier but in the main the present dearth of coal business leading to further curtailment of mine operations is limiting purchases. This in a way is responsible for the letdown in small spike business. The market is quotable on small spikes at 3.50c, base Pittsburgh, although some users report ability to obtain a lower figure. Standard spikes are unchanged at 3.15c, base Pittsburgh, as far as local producers are concerned, notwithstanding the fact that it is reported that the Louisville & Nashville railroad placed an order at a lower price. The Baltimore & Ohio railroad likewise was in the market for both standard spikes and track bolts, the requirements of the two roads equaling about 30,000 kegs. Other inquiries are current for 200 to 500 kegs of spikes at a time. Purchases of tie plates continue to be deferred although makers have good backlogs of business and are unable to make prompt deliveries. Local producers continue to quote a minimum of $52 per ton, or 2.60c, base Pittsburgh. Track bolts are unchanged at 4.00c.

Locomotive Orders Placed

New York, Oct. 30—Orders for 68 locomotives feature the eastern railroad equipment market. Of this number, 43 are for the Southern Pacific 25 to be built by the Baldwin Locomotive Works, and 18 by the American Locomotive Co. The remaining 25 are for the Delaware, Lackawanna & Western railroad, this business going to the American Locomotive Co. Car business is showing slight improvement. Export inquiries are out for approximately 600 freight cars. Outstanding in the new inquiry for cars is that of the Chicago, Burlington & Quincy for 1000 gondolas and repairs for 1000 miscellaneous cars for the St. Louis Southwestern railway.

Pennsylvania Order Unplaced

Philadelphia, Oct. 30.—The rail order of the Pennsylvania railroad for 1924 delivery has not yet been closed. Tentatively however, the distribution, it is stated, will be 100,000 tons to the Steel corporation mills, 85,000 tons to the Bethlehem Steel Corp. and 12,000 tons to the Inland Steel Co.

CAR ORDERS PLACED

Chesapeake & Ohio, six combination mail and express cars, to Pullman Co.

CAR ORDERS PENDING

Chicago, Burlington & Quincy, 1000 gondolas; bids asked.
National Railways of Mexico, 425 box cars; pending.
Central of Brazil, 200 gondolas; bids asked.
Chesapeake & Ohio, 25 caboose cars; pending.
St. Louis Southwestern, repairs on approximately 1000 box cars; bids asked.
Philadelphia & Reading, 50 stock cars and 20 cabooses; pending.
Lehigh Valley railroad, 25 milk cars; pending.
Baltimore & Ohio, 54 coaches; pending.

Fuel and Iron Has Deficit

Operations of the Colorado Fuel & Iron Co., Denver, Colo., resulted in a deficit of $316 644 in the third quarter of the year. This compares with a deficit of $131,463 in the corresponding quarter of 1922. The statement disclosed an income of $66,026 above fixed charges from which was deducted depreciation of $382,671.

The Otis Steel Co., Cleveland, reports net income for the nine months ended Sept. 30 of $1,156 458 after charges and reserves for subsidiaries, but before depreciation. In the corresponding period of 1922 there was a deficit of $795,471.

The Nonferrous Metals

European Affairs Give Metals Some Cheer but Copper and Zinc Prices Change Little—Tin Up and Down

	Copper—Electro delivered	Copper—Lake delivered	Spot Straits New York	Lead† New York basis	Zinc St. Louis basis	Spot† aluminum	Spot antimony	Nickel spot
Oct. 24	12.75	13.00	41.75	6.85	6.27½	25.00	8.12½	29.00
Oct. 25	12.50	13.00	42.50	6.75	6.30	25.00	8.25	29.00
Oct. 26	12.50	13.00	42.37½	6.75	6.35	25.00	8.50	29.00
Oct. 29	12.50	13.00	41.75	6.75	6.35	25.00	8.50	29.00
Oct. 30	12.50	13.00	41.75	6.75	6.30	25.00	8.62½	29.00

†Outside market quotation.

NEW YORK, Oct. 30.—The foreign news of the past week has contributed a little more cheerful sentiment to the metal markets, though the immediate market response has been slight, due to the realization that a long road must yet be traveled before European economic stability is reached.

Electrolytic copper prices broke from 12.87½c to 12.50c, delivered, last week, under a wave of selling pressure which ended with the cables that told of the French consent to the application of the Hughes plan. This checked the decline, which extended throughout the list of copper and allied products. Rolled and drawn products prices were reduced on Friday ½ to 1 cent a pound. Casting copper sold down to 12.25c.

Strength in the Joplin zinc ore market with large sales at $40 a ton, helped the slab zinc market resist declines, but our market continues to follow the daily fluctuations in London. American zinc sellers must export part of their current product to avoid accumulating a surplus and therefore the price that Europe is willing to pay is influential in establishing our market. Prime western sold between 6.25c and 6.37½c the past week.

Foreign lead prices have continued their sharp rise until now Europe is a more attractive market for lead originating in foreign ores than the United States. Our market has been dull despite the withdrawal of all foreign supplies. On Oct. 25 the American Smelting & Refining Co. reduced its official price to 6.75c, New York, and the outside market did likewise. For middle western delivery the price has declned to 6.50c, East St. Louis.

Tin prices have been influenced both by the swings in sterling exchange and wide fluctuations in London, which have caused wide price variations here daily. Spot Straits quotations have ranged between 40.87½c and 42.50c the past week. Due to a temporary shortage of spot a premium of ½ cent has obtained over futures.

Aluminum prices are unchanged at 25c and 26c for 98 to 99 per cent and 99 per cent grades, respectively. The market is quiet and firm.

Mill Products

Base prices cents per pound, f.o.b. mill

SHEETS	
Copper, hot rolled, 4 oz., min.	20.25
High brass	17.00
Zinc, ga. 9 to 18 (plates ½c less)	9.25
Lead, full sheets (cut ¼c more)	10.75
Aluminum, base 18 ga. and up	35.40
SEAMLESS TUBES	
High brass	21.50
Copper	23.00
RODS	
High brass, round, ⅜ to 2½-inch	14.75
Naval brass rod	17.50
WIRE	
Copper	15.00
High brass	17.50

Old Metals

Dealers' buying prices cents per pound

HEAVY RED BRASS	
Cleveland	9.00
New York	8.00 to 8.50
Chicago	8.75
HEAVY YELLOW BRASS	
New York	5.25 to 5.75
Chicago	6.75
Cleveland	6.00 to 6.50
ZINC	
New York	4.25 to 4.50
Cleveland	3.50 to 3.75
Chicago, dross	4.25
HEAVY COPPER AND WIRE	
Cleveland	10.25 to 10.50
New York	10.00 to 10.50
Chicago	10.50
RED BRASS TURNINGS	
New York	7.00 to 7.50
Cleveland	8.00
Chicago	8.00
YELLOW BRASS TUBING	
Cleveland	5.75
NO. 1 BRASS ROD TURNINGS	
Cleveland	6.00
New York	5.50 to 6.00
Chicago	6.50
ALUMINUM BORINGS	
Cleveland	9.50 to 10.00

Protest Car Order

Iron and Steel Executives Insist on Controlling Own Equipment

Washington, Oct. 30.—Iron and steel producers, railroad executives and coal operators have been submitting testimony at the rehearing of the assigned car case before Commissioner Aitchison of the interstate commerce commission. The assigned car order, the effective date of which has been set for Dec. 1, holds that privately owned cars are not to be restricted to the service of their owners during car shortages, and that mines furnishing railroad fuel are not to be given a special car supply in similar emergencies.

Iron and steel producers declared that they will be in particular need of their cars in times of peak demand, to obtain the grade of fuel necessary for the satisfactory operations of by-product coke plants.

Charles M. Schwab, chairman of the Bethlehem Steel Corp., and James A. Campbell, president of the Youngstown Sheet & Tube Co., testified Saturday that the ownership of private railroad cars has solved difficult fuel questions for their plants. Mr. Schwab declared that the Bethlehem corporation's cars helped to assure a more constant operation of blast furnaces and other departments. Mr. Campbell stated that since the Youngstown Sheet & Tube Co. acquired its cars, the company's coal problems have been simplified and it is possible to obtain the grade of coal needed for by-product coke production without serious difficulty.

Similar statements were made by Robert Hobson, president of the Steel Co. of Canada, Ltd. Coal for the company's by-product coke ovens is mined in West Virginia fields. It has 400 cars.

L. C. Bihler, traffic manager, Carnegie Steel Co., said the subsidiary plants of the Steel corporation own 5200 cars and the fuel problem has been reduced considerably by the use of private cars and through the assigned car practice.

Mr. Schwab stated the service obtained with private cars has compensated for their cost, while Mr. Campbell said his company charges off 2½ cents to 3 cents per ton of coal carried, toward the cars' cost.

W. B. Prescott, coal and coke agent, Youngstown Sheet & Tube Co., John M. Gross, traffic manager, Bethlehem Steel Corp., and Harry Coulby, a partner of Pickands, Mather & Co. also testified.

Coke By-Product Prices Remain Unchanged

New York, Oct. 30.—Steadiness characterizes the coal tar by-products market, prices all down the line being unchanged. As reported last week, however, a stronger tone prevails in industrial benzol. Dullness continues pronounced in sulphate of ammonia, there being little domestic or foreign buying. Japan is still feeling out the market but little buying is likely to develop for some time, according to leading sellers.

Coke Oven By-Products

Spot*

Per Gallon at Producers' Plants in Tank Lots	
Pure benzol	$0.23
Toluol	0.25
Solvent naphtha	0.25
Commercial xylol	0.27 to 0.29
Per Pound at Producers' Plants	
Phenol	$0.26
Naphthalene flake	0.07½
Naphthalene balls	0.08½
Per 100 Pounds at Producers' Plants	
Sulphate of ammonia	$2.95 to $3.00
Contract	
Pure benzol	$0.23
Toluol	0.25
Solvent naphtha	0.25
Commercial xylol	0.29
Per Pound at Producers' Plants	
Phenol	$0.26
Naphthalene flake	0.07½
Naphthalene balls	0.08½

*Spot distillates are subject to shading.

Chicago Stacks Resume

Chicago, Oct. 30.—The two blast furnace stacks at the Joliet works of the Illinois Steel Co. banked pending repairs to mills have resumed, giving the company 23 of its 27 steel works stacks active. Its general rate of operation is around 93 per cent. Inland Steel Co. continues unchanged at about 75 per cent of capacity.

Record Building on Coast

Structurals and Reinforcing Bars in Demand—Pig Iron and Coke Remain Dull—Steel and Iron Pipe Moving Well

LOS ANGELES, Oct. 27.—Although little has occurred in the local market for iron and steel products the past week, the general tone is better and all interests expect a good volume of business the remainder of the year.

Building activity shows little sign of lessening and a record is looked for in October. Including Oct. 16 permits had been issued for 3532 buildings with an estimated valuation of $11,313,772, compared with 2811 permits and a vaulation of $7,833,931 for the corresponding period in September.

Further reports indicate steamship companies are breaking away from the 40-cent conference rate for heavier lines of steel products shipped from the east to Pacific ports and several have actively solicited tonnage at 35 cents. Nonconference lines have been booking at 35 and 30 cents for some time past and the trade believes this will be general shortly.

Pig Iron and Coke

Little improvement is noted in pig iron and coke and no large sales were made. Stocks generally are heavy but one large dealer stated his sales have shown an encouraging monthly increase. With southern iron now being quoted at $19, base Birmingham, for No. 2 foundry, it is thought some sales will be made as this price will permit it to compete with foreign material. While lots of 500 tons up can be bought around $30 c.i.f., San Pedro, the general price for smaller tonnages is $31 to $33. One large foundry recently purchased 500 tons of Scotch coke at $16, San Pedro.

Bars, Plates and Shapes

A fair volume of concrete bar business is coming out but demand for merchant soft steel bars is limited. Awards for reinforcing bars during the week totaled over 500 tons and several thousands tons are pending. Numerous lettings have been made for lots of less than 100 tons. Prices are being firmly maintained and deliveries are fairly prompt.

No action has been taken on 600 tons of plates for two 80,000-barrel tanks for the Pan American Petroleum Co. This is the only tank inquiry pending in this market. The city of Pasadena will open bids Oct. 29 for 17,000 feet of 16-inch riveted pipe, involving 250 tons of from 8 to 14 gage blue annealed sheets. Prices have firmed somewhat and 2.60c, Atlantic seaboard, is the best known to have been done this week.

Structural awards totaled over 2000 tons in this section last week, the largest involving 1300 tons for the Hellman bank building in Los Angeles to the Llewellyn Iron Works. Over 3000 tons are up for figures and the outlook is encouraging. Prices remain unchanged at from 2.90c to 3.00c c.i.f., coast ports.

Other Finished Material

Demand for cast iron pipe from municipal and private sources is fairly active and over 1200 tons have been awarded, while close to 7000 tons is pending. A good deal of publicity has been given in the newspapers of Los Angeles to the award recently made by the public service commission to a French concern for 5200 tons of cast iron pipe. An analysis of the bids shows that one American manufacturer was several hundred dollars under the price quoted by the French company, but did not receive the award.

Oil country goods and standard merchant pipe are active and little improvement is noted in delivery or the condition of stocks. Some tonnages of line pipe are pending but no large lines have been closed. Oilfield operations reported to the state oil and gas supervisor for the week ending Oct. 13 show 26 new wells started, compared with 24 during the preceding week. Total new wells this year to date is 1311, compared with 1096 the same date last year. Tests for water shut-off numbered 36, compared with 28 the previous week. Yearly total to date 1562; total same date last year 1357. Deepening or redrillng jobs numbered 8, compared wth 10 the precedng week. Total to date this year 481; total same date last year 629. Abandonments numbered 4, compared wth 9 the prevous week. Total this year to date 226; yearly total last year same date 213.

Northwest Fairly Active

SEATTLE, Oct. 27.—While some branches of the iron and steel trade find a slackening, general conditions are satisfactory. Building continues unabated and much new construction is being announced, both here and at Portland. Public improvements are being rushed, logging and lumbering are at capacity and the outlook in general is favorable.

The Manufacturers' association of Washington announces that 107 new plants have been added to its list since Jan. 1. Statistics show that foundries and machine shops are third in output in this state. Employment officers report that conditions were never better at this time of year. In August and September the Seattle public employment office had 42,494 calls for help, compared with 34,874 in the same two months last year and 20,375 in 1921.

The city of Seattle will shortly authorize an issue of $200,000 bonds for reconstruction of street car tracks. Work is progressing rapidly on the new $1,500,000 Spokane street steel bridge which will be completed next August. The Bethlehem Steel Corp.'s San Francisco plant is fabricating the superstructure, the first shipment to be made within 30 days. In all 1900 tons of structural steel and 160 tons of machinery will be used in this structure. Announcements of the week include a $225,000 apartment house.

Pig Iron and Coke

The situation in pig iron is about the same as a week ago. Spot Glengarnock is selling at $35. Buying is from hand-to-mouth for immediate needs although the outlook is firm and a decided buying movement for first quarter delivery is anticipated within 30 days. The domestic market remains soft but foreign prices have advanced $4 in some instances. Importers believe that prices have reached the bottom and look for heavy purchasing soon. Some British iron has been sold here for delivery in the first quarter of 1924 but many orders are yet to be placed. No domestic iron is being sold here. The coke situation remains unchanged.

Bars, Plates and Shapes

Merchant bars have declined from 3.20c to 3.10c, placing the local market on a parity with eastern prices. In line with this adjustment Portland jobbers have cut prices from 4.20c to 4.10c, base. Similar action has not been taken by Seattle houses but the matter is under consideration. While demand for bars is somewhat less active than during the summer, business remains satisfactory for this season. As a rule small tonnages predominate, not many big jobs being in sight. Export inquiry for bars is at a minimum, the Orient apparently being more interested at present in European prices. Bids were received at Portland this week for the first pier of the Burnside street and Ross Island bridges. The first job involves about 125 tons of reinforcing bars. The entire Burnside contract will require about 800 tons and Ross Island about 400 tons of reinforcing steel. Plates and shapes are in fair demand.

Some fabricating plants find business falling off. Less work is in sight and the fabricating capacity of this section is in excess of requirements. Fabricators as a whole have had a busy season and a majority of the plants are still engaged heavily. Jobbers find the turnover good.

One importing house continues to receive shipments of 60-pound standard rails from French and Belgian makers. These are being sold to logging companies in this state where active extension of roads is under way.

Autumn Upswing Still Lagging

Business Sentiment Faces Realities—Illusions of Boom Conditions Are Passing With Growing Recognition of More Competitive Business—Now Existing Prices Are Declining—Basic Conditions Are Sound

BY JOHN W. HILL, FINANCIAL EDITOR

THE passing of October has brought business into the midst of autumn with no sign of the predicted rapid expansion of activities. With the flitting of illusions of boom conditions, there is a growing tendency to face the actualities. Manufacturing operations have declined from spring peaks, but continued large consumption, easy credit conditions and the absence of generally excessive stocks are factors preventing a precipitate drop. Hand-to-mouth buying and ample outputs and stocks are conducive to keenly competitive conditions, even though the volume of trade continues substantial. That is the present prospect. In iron and steel the outlook is that stimulation is coming from railroad buying.

The course of prices has been interesting and significant. Wholesale values advanced violently for some months prior to last spring. Then the flight was checked and a gradual decline started which continued until August. Stiffening which appeared in that month has not fulfilled expectations of an important rise. Buyers' are stubbornly resisting all wholesale advances. During the last three weeks *Dun's Review* reports more declines and increases in commodities.

IRON TRADE REVIEW's composite market index of 14 iron and steel prices has fallen 8 per cent since May. It is now 64 per cent above the 1913 level. All wholesale commodities are about 54 per cent above prewar, indicating that iron and steel are slightly out of line. Living costs are now rising, reflecting advanced raw materials and wages and large seasonal demand. The cost of living is now 61.3 per cent above 1914.

Compared with 1920 the price situation is satisfactory. In that year the decline in wholesale values had reached 14 per cent by October. This year the level is only about 4 per cent under the top. Other striking points of contrast with 1920 exist. The wave of cancellations present then are absent now. The congestion of traffic which disturbed commerce and finance in 1920, has been avoided this year despite unprecedented freight movements. Three years ago the financial strain was acute. Now there is no stress anywhere.

The checked flight of prices will react upon wages. Competition will force producers to pare costs. Reduced industrial activity and a freer supply of labor will stop the wage advance. Increased immigration, shown by the Business Trend, and the influx of 500,000 southern negroes to northern centers have enhanced the supply of labor. In October the national industrial conference board finds only 28 wage increases compared with a monthly average of 160 in the first half of the year.

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The Barometer of Business

WEEKLY COMPARISON

	Last week	Week before	One mo. ago	One year ago	Average 1913
Business failures	387	351	357	372	...
Cash ratio Fed. Res. System	76.8	75.3	76.4	77.6	...
Loan rate, 4-6 Mo. N. Y. (per cent)	5-5¼	5-5¼	5-5¼	4¼-4½	5½-5¾
Aver. 25 ind'l shares	$99.67	$101.84	$100.93	$106.67	$58.19
Average 25 rail shares	$55.48	$57.03	$56.60	$68.53	$82.97
Aver. 40 bonds	$75.81	$76.08	$75.59	$76.30	$93.00
Car loadings (week ended Oct. 13)	1,084,000	1,079,690	1,060,580	969,487	*1,018,818
Bank debits 247 cities (000 omit'd)	$9,222,978	$8,836,627	$8,838,994	$9,920,908	.....

*1920

FOREIGN EXCHANGE (Demand)

	Normal	Oct. 29 (close)	Week before	Month ago	Year ago
Sterling	$4.86	$4.48	$4.49	$4.53	$4.45
Francs	19.3c	5.84c	5.78c	5.93c	7.03c
Lira	19.3c	5.03c	4.43c	4.48c	3.97c
Marks	23.8c	.....	0.000000003c	0.0000004c	0.02c

MONTHLY COMPARISON

	September	Month before	Year ago	Monthly average 1913
Dodge building Awards in 36 states	$288,971,000	$298,629,000	$310,000,000	$82,126,000
Business failures: Number	1226	1310	1566	1336
Liabilities	$28,000,000	$34,334,722	$36,908,000	$22,732,000
Exports	$381,000,000	$311,352,000	$313,196,000	$207,000,000
Excess of gold imports	$26,780,000	$30,636,000	$23,065,628	†630,716
Bureau of Labor Price Index	154	150	153	100
Bradstreet's Price Index	141.6	139.7	130.7	100
Economist's British Price Index	4305	4188	4257	2717
Cost of Living Index	163.4	161.6	155.6	100
New incorporations	$500,830,000	$335,462,000	$650,044,000	$172,301,000
Railroad net earnings	$98,600,000	$84,591,400	$51,475,000	$59,900,000

†Monthly average excess exports. *August.

The Business Trend

November 1, 1923

TRADE TODAY, TOLD BY IRON TRADE CHARTS

GENERAL SITUATION—Undertone of business sentiment slightly more confident; trade and industrial activities continue below spring peaks but in substantial volume; allied plan to examine Germany's capacity to pay reparations, constructive event; may check Europe's economic decay and result in starting long delayed post-war rehabilitation.

IRON AND STEEL PRICES—Iron Trade Review composite of 14 iron and steel prices has declined 8.3 per cent from May peak; level now 33 per cent above low point of March 1922 and 63 per cent above 1913.

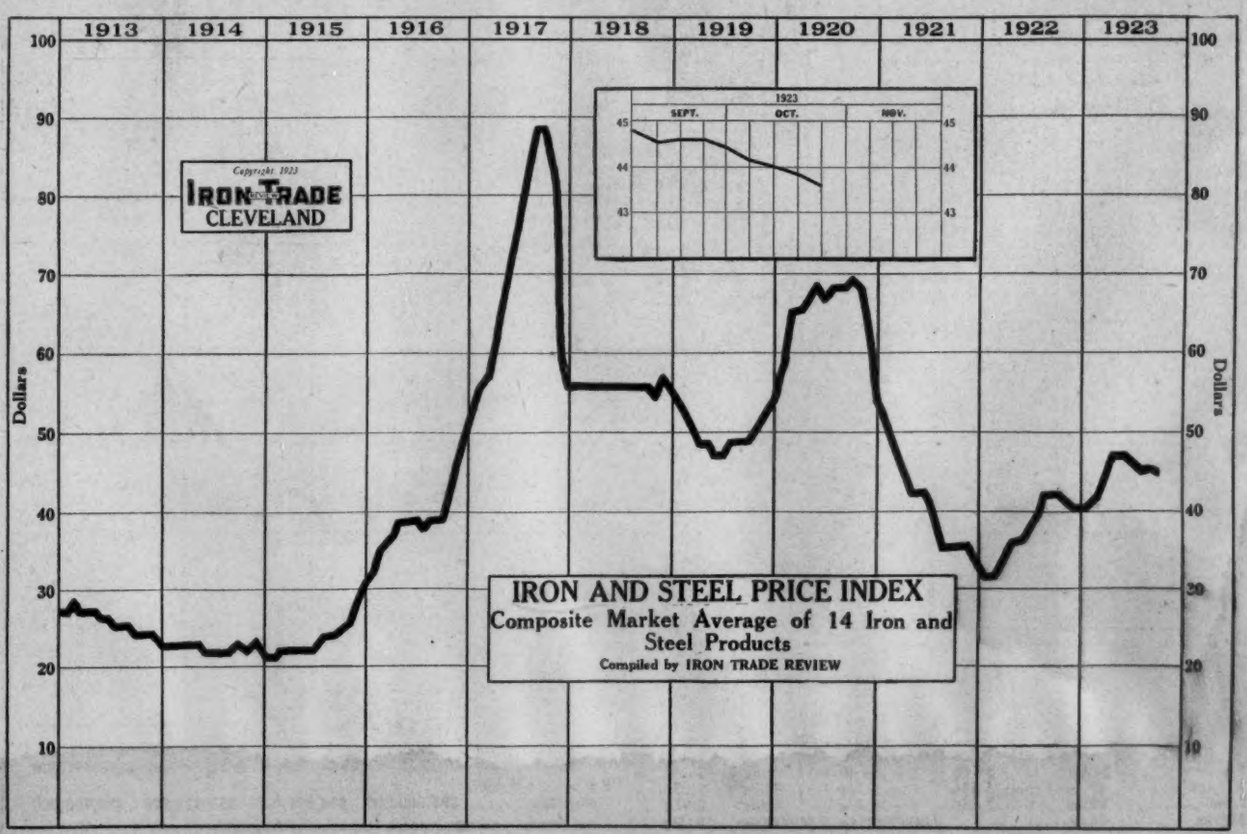
IMMIGRATION—Net excess of immigrants over emigrants in eight months of 1923 was 384,200 against 107,400 in same period of 1922; high wages attract aliens; in addition nearly 500,000 negroes came north.

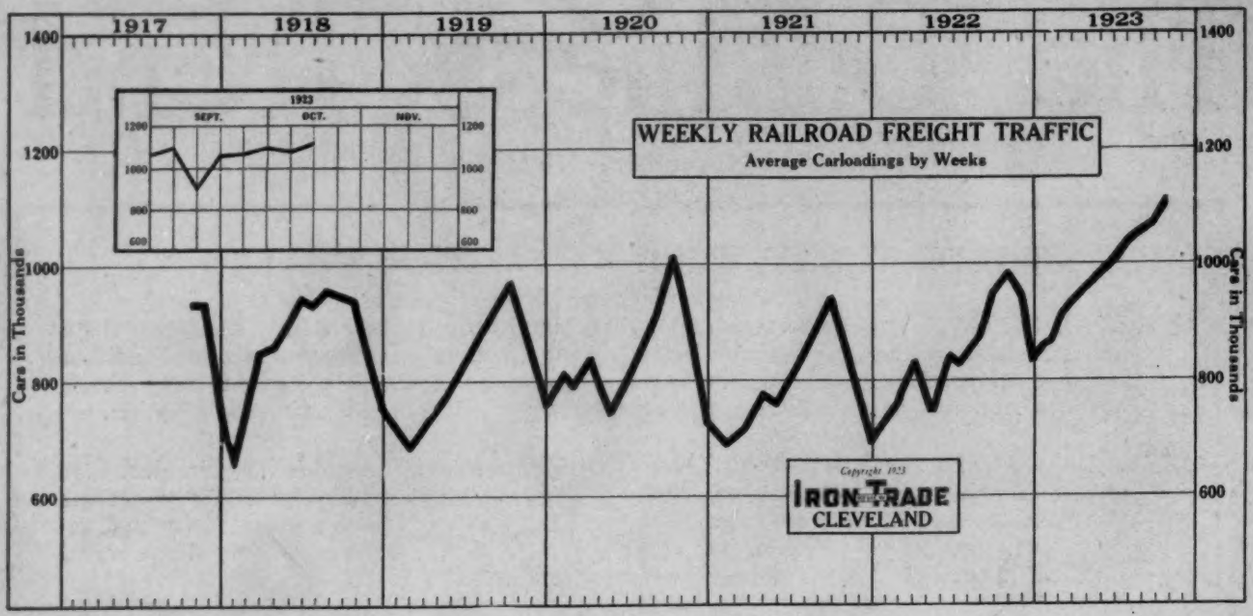
FOREIGN EXCHANGE—European exchanges slightly up as result of prospect of American participation in reparations conference; sterling recovers from extreme drop; marks virtually extinct.

COPPER—Quotation for copper drops to lowest point in months; dullness reflects large outputs; economic stability and recuperation in Europe may help metal markets.

TRAFFIC—Car loadings in week ended Oct. 13 reach 1,084,000; this is slightly below peak of year in week ended Sept. 29; net daily average of surplus cars continue to dwindle; only 11,000 in second week of October.

STRUCTURAL AWARDS—September awards were lowest for any month since November 1922, save in July 1923; sales were at 53 per cent of shop capacity against 59 per cent in August and 51 per cent in July.




1917
1918
1919
1920
1921
1922
1923
1923
SEPT.
OCT.
NOV.
WEEKLY RAILROAD FREIGHT TRAFFIC
Average Carloadings by Weeks
Cars in Thousands
1400
1200
1000
800
600
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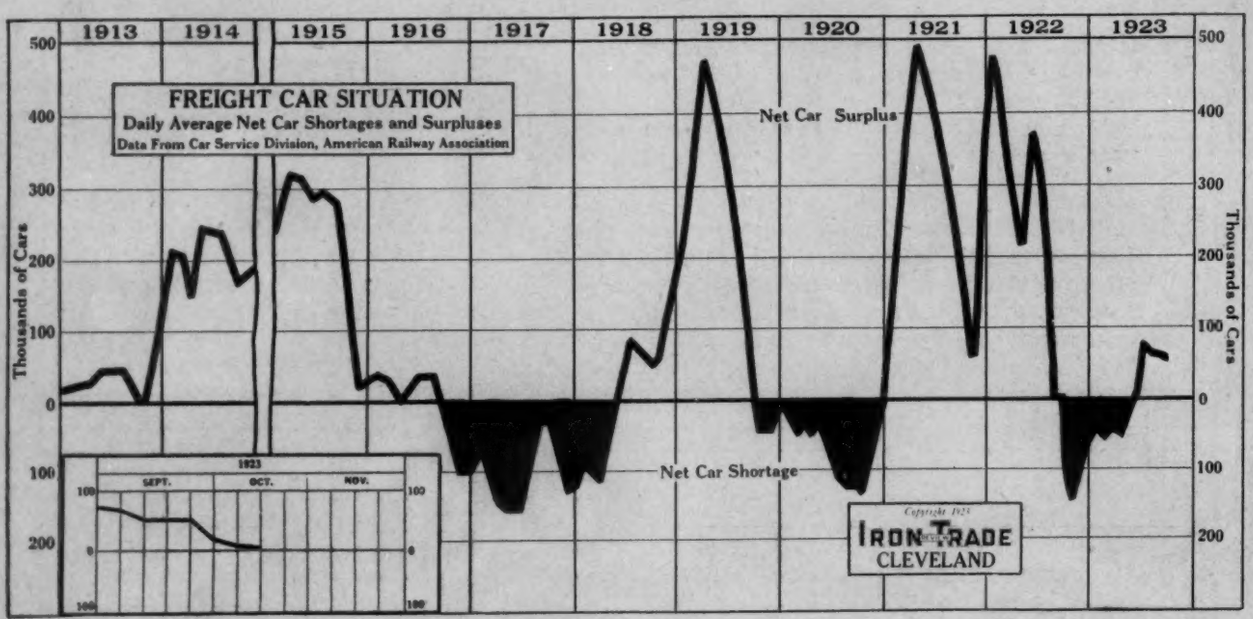
IRON TRADE
CLEVELAND


1913
1914
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1918
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1921
1922
1923
FREIGHT CAR SITUATION
Daily Average Net Car Shortages and Surpluses
Data From Car Service Division, American Railway Association
Net Car Surplus
Net Car Shortage
Thousands of Cars
500
400
300
200
100
0
100
200
1923
SEPT.
OCT.
NOV.
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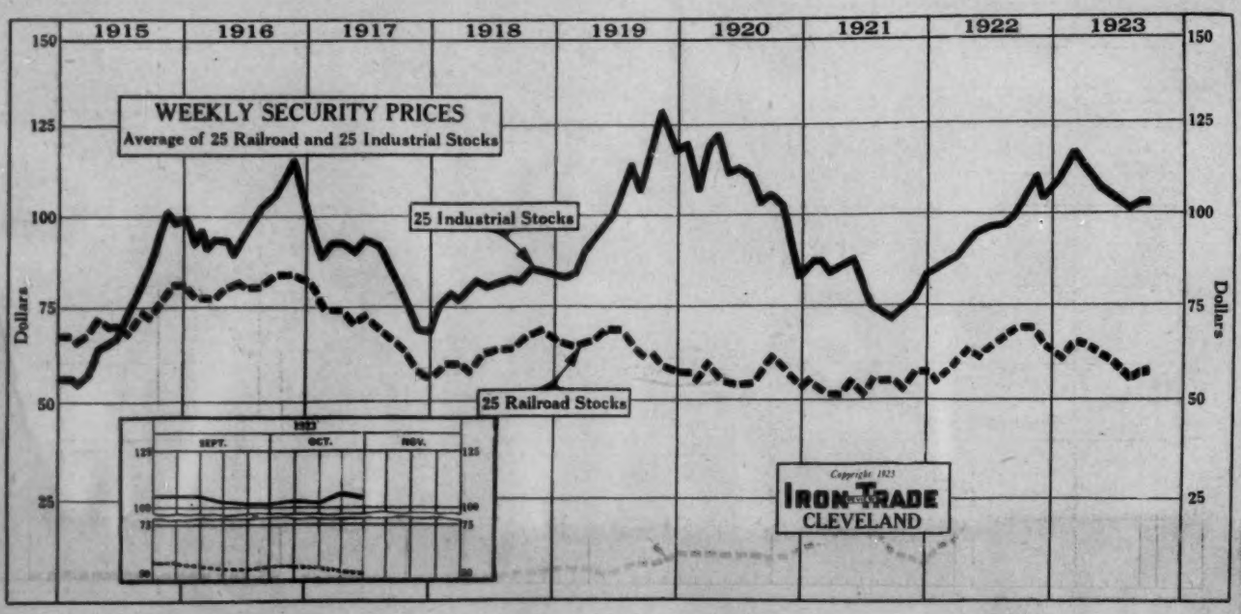
1915
1916
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1918
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1922
1923
WEEKLY SECURITY PRICES
Average of 25 Railroad and 25 Industrial Stocks
25 Industrial Stocks
25 Railroad Stocks
Dollars
150
125
100
75
50
25
1923
SEPT.
OCT.
NOV.
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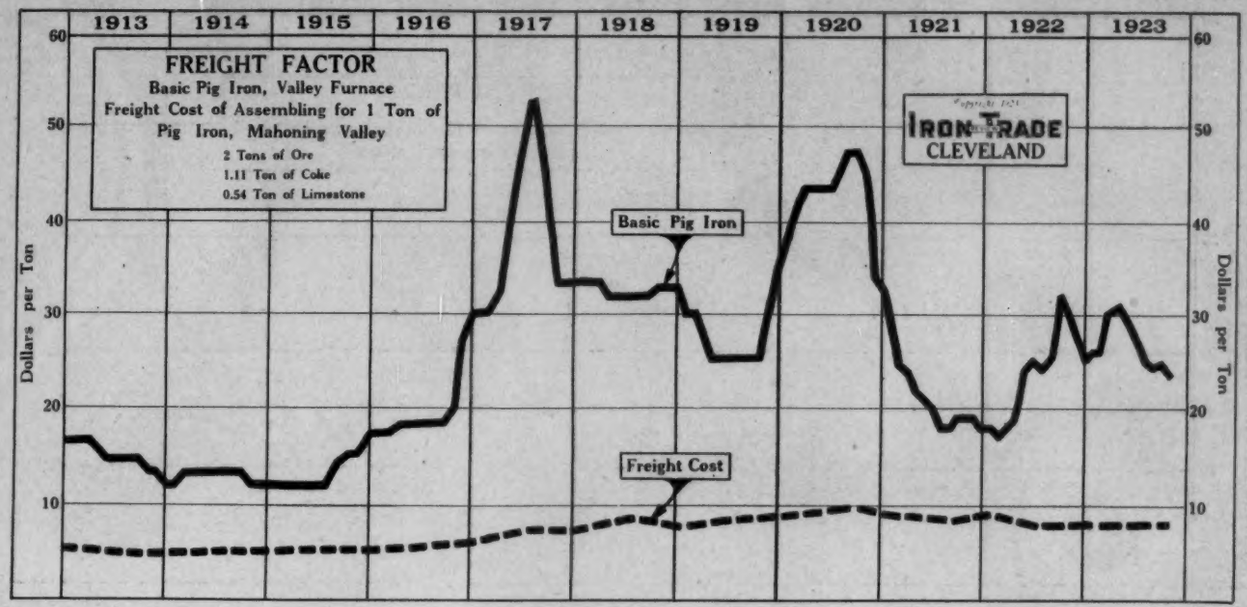
CLEVELAND


1913
1914
1915
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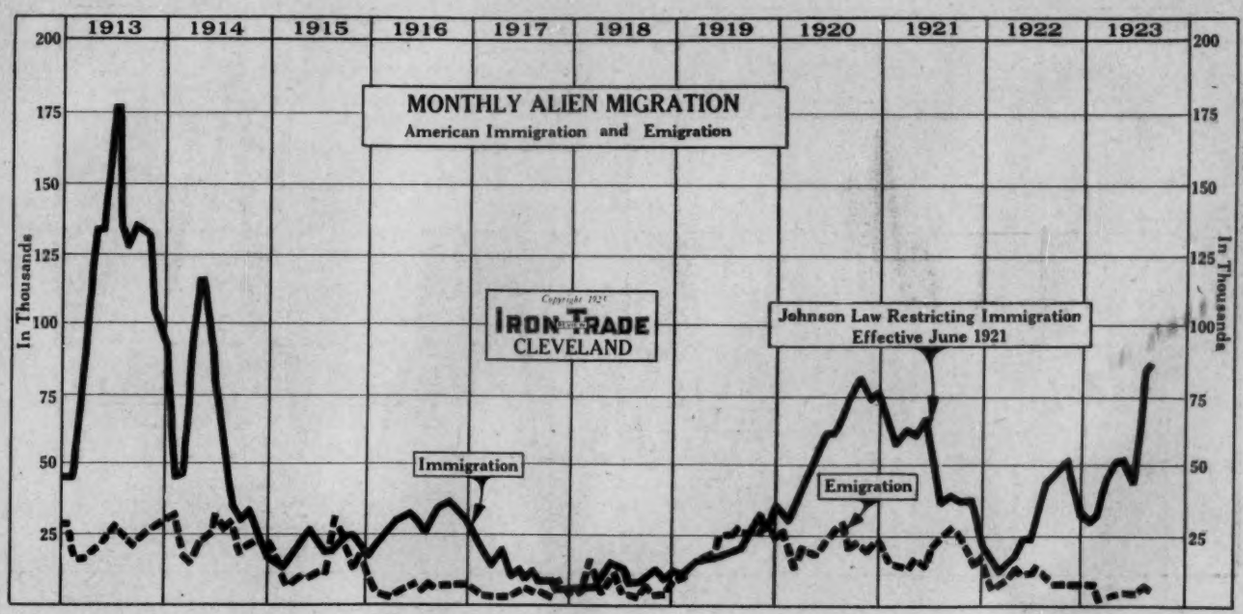
1917
1918
1919
1920
1921
1922
1923
FREIGHT FACTOR
Basic Pig Iron, Valley Furnace
Freight Cost of Assembling for 1 Ton of Pig Iron, Mahoning Valley
2 Tons of Ore
1.11 Ton of Coke
0.54 Ton of Limestone
IRON TRADE
CLEVELAND
Basic Pig Iron
Freight Cost
Dollars per Ton
60
50
40
30
20
10


1913
1914
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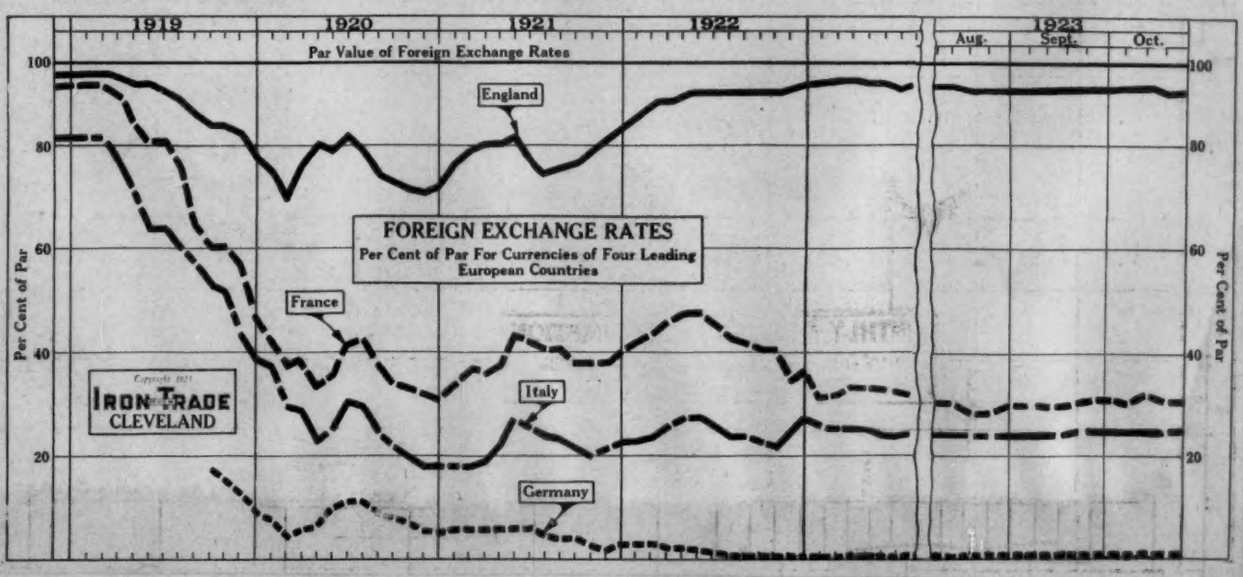
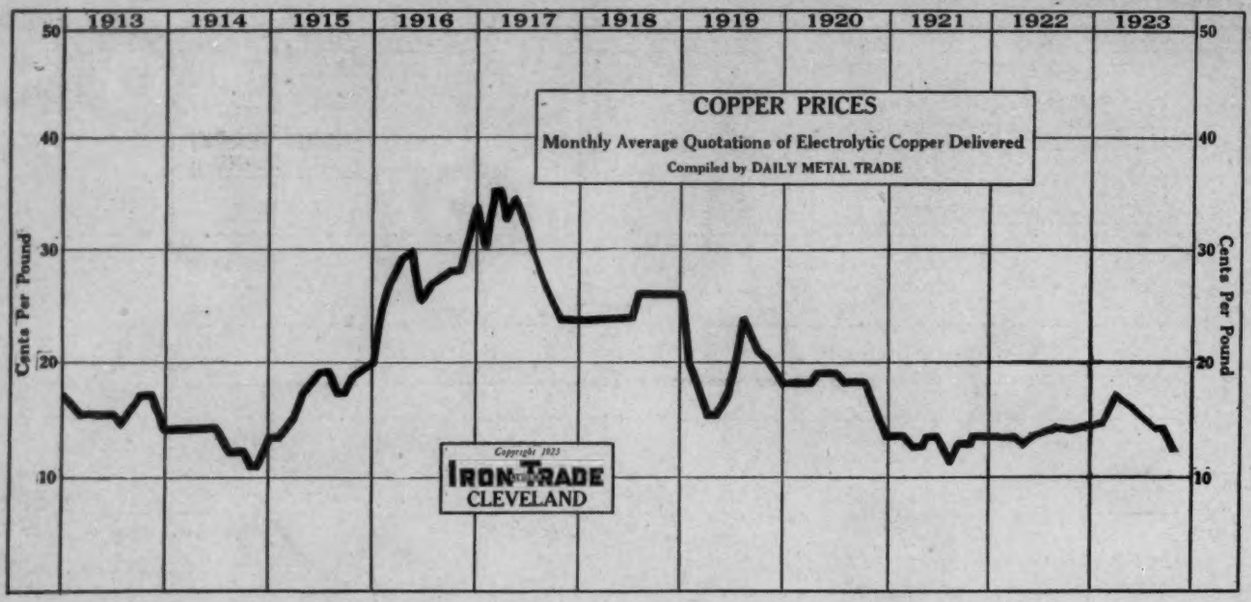
1919
1920
1921
1922
1923
MONTHLY ALIEN MIGRATION
American Immigration and Emigration
IRON TRADE
CLEVELAND
Johnson Law Restricting Immigration
Effective June 1921
Immigration
Emigration
In Thousands
200
175
150
125
100
75
50
25


1919
1920
1921
1922
1923
Aug.
Sept.
Oct.
Par Value of Foreign Exchange Rates
England
FOREIGN EXCHANGE RATES
Per Cent of Par For Currencies of Four Leading European Countries
France
Italy
Germany
IRON TRADE
CLEVELAND
Per Cent of Par
100
80
60
40
20


1913
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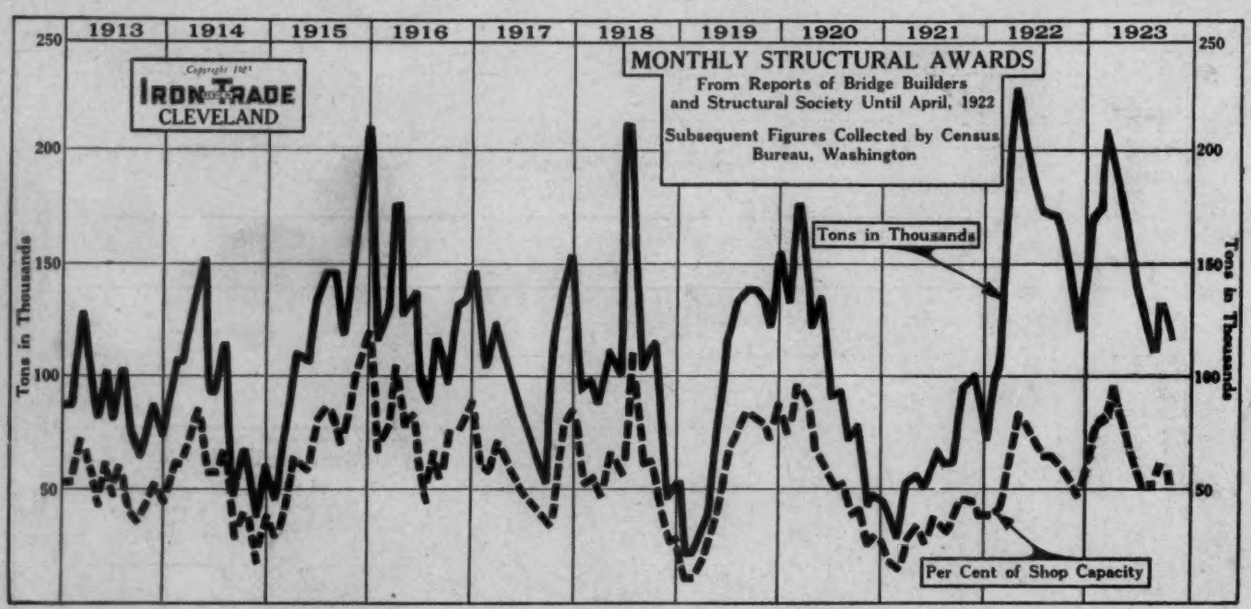
COPPER PRICES
Monthly Average Quotations of Electrolytic Copper Delivered
Compiled by DAILY METAL TRADE
Cents Per Pound
Copyright 1923
IRON TRADE
CLEVELAND


1913
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250
200
150
100
50
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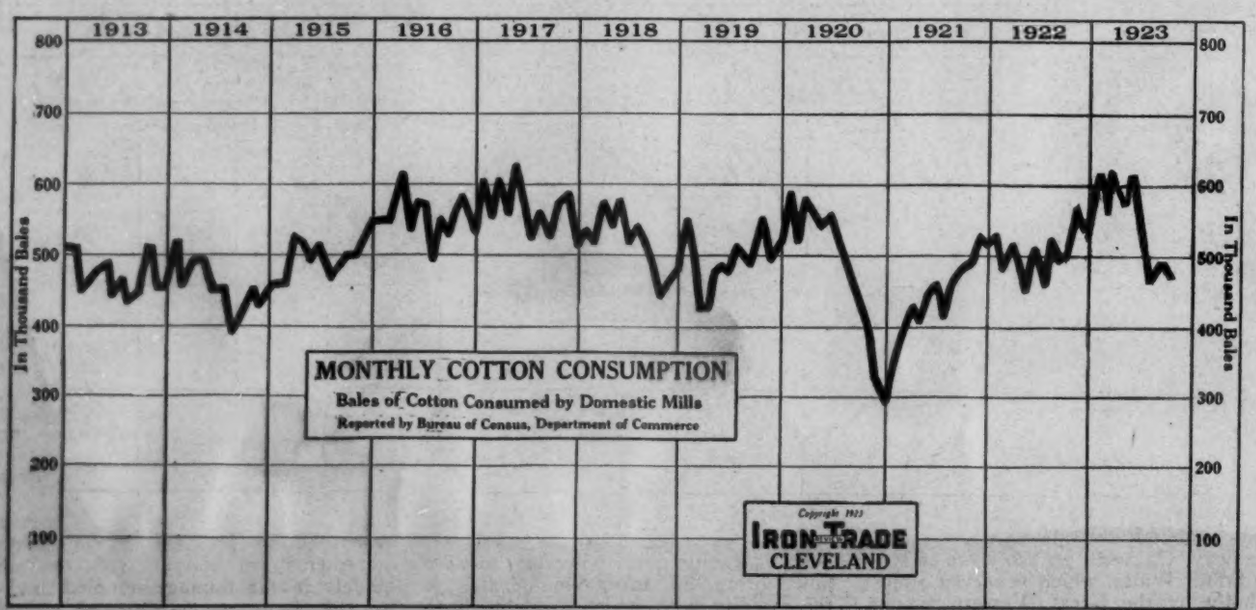
CLEVELAND
MONTHLY STRUCTURAL AWARDS
From Reports of Bridge Builders
and Structural Society Until April, 1922
Subsequent Figures Collected by Census
Bureau, Washington
Tons in Thousands
Tons in Thousands
Per Cent of Shop Capacity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1921
1922
1923
800
700
600
500
400
300
200
100
In Thousand Bales
MONTHLY COTTON CONSUMPTION
Bales of Cotton Consumed by Domestic Mills
Reported by Bureau of Census, Department of Commerce
Copyright 1923
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CLEVELAND

British Tariff Plan Significant

New Policy Would Limit American Export Markets and Force Investments in Canadian Plants—Steel Trade Disagrees on Premier's Program—Ruhr Directors Released, Production Continuing—Pig Iron Higher

Iron Trade Review Staff Cable

European Headquarters,
IRON TRADE REVIEW,
2-3 Caxton House, Westminster, S. W.1

LONDON, Oct. 30—Premier Baldwin's advocacy of tariff protection for Great Britain is endorsed by the majority of the producing sections of the iron and steel industry but is opposed by the powerful merchant classes. It is believed here that the announcement foreshadows the eventual abandonment of Great Britain's traditional free trade policy, which coupled with imperial preferences will tend to limit American export markets and force large investment of American capital in Canadian plants.

European business interests are not sanguine as to benefits resulting from the proposed reparations inquiry, and a settlement still is believed to be far off. Meanwhile political instead of business considerations continue to dominate the European situation.

Leading producers in the Ruhr have agreed to modified French demands in respect to reparation coal shipments, and therefore the Ruhr mines and steel works will not be closed. Krupp von Bohlen and other important steel directors have been released from jail, having signed an agreement to supply France to the extent of 20 per cent of their total production and to pay the coal tax for which they are in arrears. The Stinnes group has made a similar agreement. A gradual but very slow revival of industrial operations in the Ruhr is expected, disorganization of railroad service preventing rapid resumption.

The French government has announced that it will prevent the dumping of Ruhr steel in the world markets. Reports as to the quantities available, such as 2,000,000 tons, are exaggerated, not over 500,000 tons being salable. The world need not fear an avalanche of German competition under whatever regime eventually is established, as high costs and taxes in the Ruhr district are inevitable.

IRON TRADE REVIEW's correspondent at Paris reports that the French coke situation is the best since January.

Leading manufacturers of steel in Great Britain met in London last week to discuss a renewal of the fixed-price agreements. The plan was favored. A sharp advance averaging 3 shillings ($0.67) has been made in the price of pig iron, following the booking of more than 100,000 tons by Middlesbrough furnaces at recent low price levels. A considerable tonnage of pig iron has been purchased for the first quarter, but the new prices have not been tested. Ferromanganese has been reduced 10 shillings ($2.24) to £17 ($76.25). French, Italian and Belgium consumers are good buyers of English hematite.

South African railways have placed an order for 300 tons of locomotive tires with a mill in the eastern district of the United States.

Changes in prices in the British market within the week bring the following products to the levels as quoted:

Sheet bars, £7 5s ($32.52); east coast hematite, £4 19s 6d ($22.31); No. 3 foundry iron, Middlesbrough and Scotch, £5 ($22.43); Derbyshire and Northamptonshire, £4 12s 6d ($20.74); Staffordshire, £4 15s ($21.30); ferromanganese, 76 to 80 per cent, £17 ($76.25).

Sterling exchange is figured on a basis of $4.485.

British Bridge and Rail Buying Help Market

European Staff Special

Office of IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,

Sterling—$4.53

BIRMINGHAM, Eng., Oct. 19.—The iron and steel trade has become the center of public interest, honored by more public attention than at any time since the war. The members of the government announcing bridge building and other schemes have made the most of the benefit likely to accrue to the steel trade. Steelmakers do not take quite the same view of the large business supposed to arise from the bridge building program, in view of the proportion of bridges to be built of ferro-concrete, and mills are well able to make short work of all the steel likely to be needed. More importance is attached to the arrival of orders from British railways. The 34,000 tons ordered by the Great Western Railway Co. will probably go mainly to South Wales, which is served almost wholly by the Great Western system. These orders can be only preliminary to much heavier tonnages if the railways are entering the market in real earnest. The wagon orders, since some are to be all-steel of large capacity, must give stimulus to the steel trade, and will aid plate mills figuring conspicuously in the modern plant recently laid down.

The outlook is decidedly more favorable, and there is some significance in a meeting in London this week of representative steelmakers to test the feeling with regard to fixing price agreements. Price cutting has been rife and the first sign that makers are gradually getting the upper hand is this desire to put an end to ruthless price-cutting. It is likely a scheme will develop. But there is still much idle plant capacity and powerful modern mills bring an inevitable penalty in the rapidity with which available business is licked up. The fact that September steel production was about 60,000 tons in excess of the pre-war monthly average of 1913, and only 60,000 tons behind the boom year of 1920 shows that steel production is still on a large scale.

Continental competition is not troublesome. Few quotations are being made and rerollers are practically dependent upon British steel. A quotation for billets from Belgium named £6 12s ($29.89) to £6 18s ($31.24) f.o.b. Antwerp. This material could not be bought here under £7 15s ($35.10) to £8 ($36.24). It is significant that one of the largest Welsh concerns, which has been booking at £7 15s ($35.10), has withdrawn this figure and substituted £8 ($36.24) having already a good six months' work on hand.

The galvanized sheet trade continues to make progress. Japanese requirements are scarcely reflected adequately in the tonnage handled, owing to the large proportion of thinner gages. Mills rolling these are understood to be well supplied with or-

Current Iron and Steel Prices of Europe

Last Reported Prices Converted into Dollars at Rates of Exchange, October 29

British Market

Corrected to Date by Cable
Home Market Prices. Gross Tons at Works or Furnace

	$	£ s d
SEMIFINISHED STEEL		
Billets, soft steel	32.52	7 5 0
Sheet bars	32.52	7 5 0
Wire rods	48.77	10 17 6
FINISHED STEEL		
Steel bars, England, ⅝ to 3-inch	40.93	9 2 6
Steel bars, England, ⅝ to 3-inch, for export	38.12	8 10 0
Plates, ship, bridge and tank, England	41.49	9 5 0
Plates, ship, bridge and tank, England, for export	39.80	8 17 6
Plates, ship, bridge and tank, Scotland	41.49	9 5 0
Plates, ship, bridge and tank, Scotland, for export	40.37	9 0 0
Beams, England	40.37	9 0 0
Beams, England, for export	38.12	8 10 0
Beams, Scotland	40.37	9 0 0
Beams, Scotland, for export	38.12	8 10 0
Sheets, black, 24 gage	58.31	13 0 0
Sheets, black, 24 gage, for export	57.18	12 15 0
Sheets, galvanized, 24 gage	86.34	19 5 0
Rails, 60 pounds and over	38.12	8 10 0
Rails, 60 pounds and over, for export	35.88	8 0 0
Tin plate, base box, 108 pounds	5.16	1 3 0
Steel hoops	51.58	11 10 0
Steel hoops, for export	49.34	11 0 0
PIG IRON		
Hematite, East Coast, Mixed Numbers	22.31	4 19 6
Hematite, West Coast, Mixed Numbers	21.75	4 17 0
Basic, Middlesbrough	20.74	4 12 6
No. 3 Foundry, Middlesbrough	22.43	5 0 0
No. 3 Foundry, Derby, Leicester, Nottingham	20.74	4 12 6
No. 3 Foundry, Northamptonshire	20.74	4 12 6
No. 3 Foundry, Staffordshire	21.30	4 15 0
No. 3 Foundry, Scotch	22.43	5 0 0
Ferromanganese, 76 to 80 per cent	76.25	17 0 0
COKE		
Yorkshire furnace	5.38	1 4 0
Yorkshire furnace, for export	10.09	2 5 0
Welsh foundry	7.29	1 12 6
Welsh foundry, for export	10.65	2 7 6

Where no separate export prices are given, same quotations apply to domestic and foreign business.

German Market

Prices Last Reported

	$	Pounds per metric ton (2205 lbs.)
PIG IRON		
Hematite	26.01*	5 16 0
Foundry, No. 3	26.01	5 16 0
Stahleisen, Siegen	28.03	6 5 0
Foundry, No. 1	26.01	5 16 0
Luxemburg Foundry, No. 3		Nominal
COKE		
Lower Silesian furnace	13.55	3 0 5
Lower Silesian foundry	13.55	3 0 5
SEMIFINISHED STEEL		
Billets	41.41	9 4 8
Sheet bars	42.98	9 11 8
Wire rods	52.03	11 12 0
FINISHED STEEL		
Standard rails	49.45	11 0 6
Merchant bars	49.11	10 19 0
Structural shapes	48.94	10 18 3
Ship plates	55.35	12 6 10
Medium plates, 3 to 5 millimeters	69.52	15 10 0
Sheets, 1 to 3 millimeters	66.15	14 15 0
Tin plate	151.52	33 15 8
Plain wire	74.56	16 10 3
Bands and strips	61.20	13 12 11

All prices are f.o.b. furnace or mill.
*German prices now are quoted in pounds, sterling.

French Market

Prices Last Reported

	$	Francs per metric ton (2205 lbs.)
PIG IRON		
Hematite, Lorraine	28.93	495
Basic bessemer, Lorraine	25.43	435
Foundry, Longwy, No. 3, sand-cast	24.84	425
Foundry, Longwy, No. 3, chill-cast	25.43	435
Ferromanganese, 76 to 80 per cent	87.68	1,500
COKE		
French furnace	7.89	135
German furnace, f.o.b. frontier*	12.39	212
German furnace, f.o.b. frontier**	14.61	250
French foundry	9.06	155
SEMIFINISHED STEEL		
Blooms	30.69	525
Billets	33.32	570
Sheet bars	35.07	600
FINISHED STEEL		
Standard rails	37.12	635
Merchant bars	37.99	650
Angles	36.53	625
Normal beams and profiles	36.53	625
Plates, ship and tank, 10 millimeters and thicker	38.87	665
Plates, bridge and tank, 5 to 10 millimeters	39.75	680
Sheets, black, 3 millimeters	42.08	720
Sheets, blue annealed, 2 millimeters	50.27	860
Shafting, cold-drawn, 40 to 60 millimeters	73.16	1,250
Bars, 2 per cent nickel steel	105.21	1,800

All prices are f.o.b. furnace or works.
*Up to 50 per cent of normal requirements.
**Over 50 per cent of normal requirements.

Belgian Market

Prices Last Reported

	$	Francs per metric ton (2205 lbs.)
PIG IRON		
Basic bessemer, Belgian	21.15	420
Basic open-hearth, Belgian	22.66	450
Gray forge, Belgian	13.59	270
Foundry, No. 3, Belgian	22.66	450
Foundry, No. 3, Luxemburg	21.15	420
Foundry, No. 3, Lorraine	22.14	440
SEMIFINISHED STEEL		
Blooms	28.70	570
Billets	29.96	595
Sheet bars	30.71	610
Wire rods	46.57	925
FINISHED STEEL		
Standard rails	35.25	700
Merchant bars	36.76	730
Normal beams and profiles	35.25	700
Plates, 5 millimeters and thicker	38.27	760
Sheets, black, 3 millimeters	41.54	825
Sheets, galvanized, 1 millimeter	101.71	2,020
Plain wire	62.94	1,250
Galvanized wire	74.27	1,475
Wire nails	65.46	1,300

All prices are f.o.b. furnace or works.

ders until March. Demand for 24-gage sheets is not quite proportionate, no doubt accounting for the fact that £19 ($86.07) is the minimum although a premium is paid for early delivery. Several industries are taking good quantities of black sheets.

The tin plate trade is well furnished with orders for several months. The amalgamation between the firms of Richard Thomas & Co., Ltd., and the Grovesend Steel & Tin Plate Co., Ltd., is now completed, the payment to the latter company being £1,100,000. It is said recent booking of business has been sufficient to keep the mills engaged for several months. Tin plate prices are maintained on the recent basis of £1 3s 1½d ($5.23).

A slight improvement in steel scrap is maintained, low prices of a month ago having disappeared. Merchants now demand £4 5s ($19.25) as their minimum price, compared with £3 17s 6d ($17.55) a few weeks ago. The wrought iron trade shows little improvement and depression shows in the tube trade, the largest syndicate having the unusual experience of short time at its principal centers. This has reacted upon re-rolling mills and steelworks furnishing skelp. There is little demand for Staffordshire iron, although makers of best iron are able to maintain the £14 10s ($65.68) figure. Unmarked iron is weak at £11 10s ($52.09).

The bridge building program has stimulated hope in the Darlaston area of South Staffordshire where the nut and bolt business is mainly concentrated. Belgian No. 3 bars which compete with Staffordshire nut and bolt iron are higher, costing about £9 5s ($41.90) delivered. Staffordshire iron is subject to some cutting and is obtainable at £10 12s 6d ($48.13).

Pig iron has improved though without any additions to plants operating. A large furnace has been started at Middlesbrough replacing one of smaller capacity. Barrow is selling its output from the 14 furnaces at work and may shortly have to start others. Among improved foreign buying American contracts are conspicuous, and on the East Coast there is good demand for hematite. Prices are substantially unchanged, though firmer.

British Exports Gain Over Last Year

Birmingham, Eng., Oct. 19.—Returns of the British board of trade for September shows exports of iron and steel products, including scrap were 344,358

tons, compared with 330,431 tons in August and 289,344 tons in September, 1922. Imports for September were 127,893 tons, for August 121,906 tons and September last year 83,186. There was a marked falling off in pig iron exports, mostly in forge and malleable. Ferroalloys totaled 14,282 tons, against 15,247 in August. Bars, rods and angles totaled 27,117 tons, compared with 31,583 tons in August. Galvanized sheet exports increased from 41,787 tons in August to 44,056 tons in September. Railway rails increased from 16,874 tons in August to 33,635 tons in September.

Imports of steel billets were twice those of September, 1922, but show a reduction since August from 39,841 tons to 37,673 tons. Iron bars, rods and angles increased from 11,933 tons in August to 13,424 tons in September. Similar products in steel gave 9913 tons in August and 11,921 in September. In both there is a large increase over a year ago.

General exports for September were valued at £63,836,144, compared with £60,103,360 in August and £62,511,099 in September, 1922. Total imports in September were valued at £83,265,581, compared with £88,743,197 in August and £76,766,577 in September, 1922.

French Prices Lower On Larger Output

European Staff Special

Office of IRON TRADE REVIEW,
23 Rue de la Bienfaisance

PARIS, Oct. 19.—Prices of iron and steel products are being readjusted downward. Producers anticipated an increase of 25 francs ($1.50) per ton in the cost of October coke and to protect themselves had advanced pig iron prices 40 francs ($2.40) per ton. The advance in coke, however, was 12 francs ($0.72) instead of 25 francs ($1.50). But it is not believed prices will fall below July levels as stocks are low and domestic demand for current requirements is sufficient to keep the mills fairly busy. Export business is quiet. Germany has ceased buying in Lorraine and at present levels French prices are not competitive in the English market. The French government is negotiating with German industrial magnates holding large interests in the Ruhr,. The Stinnes, Krupp, Thyssen and Wolf groups are more powerful than the present German government and as the French have not yet obtained satisfaction from the latter they have decided to deal direct with German industry. The French public is now convinced that occupation of the Ruhr is slowly accomplishing its purpose.

Production of iron and steel continues to increase. The August output of pig iron exceeded July by over 50,000 tons. Steel production during August was 452,364 tons which breaks all records since 1914. Early in October phosphorus pig was quoted firm at 450 francs ($27) per metric ton, but this price is now being shaded and a Longwy furnace recently went as low as 435 francs ($26.10) f.o.b. furnace, Hematite pig ranges from 470 francs ($28.20 to 480 francs ($28.80).

A general advance in semifinished steel of 50 francs ($3) per ton was put into effect last week, but the mills have gone back to previous levels and even lower in several instances. Basic bessemer blooms have been sold as low as 540 francs ($32.40) f.o.b. mill.

Finished steel products have followed the same movement as semifinished. Mills have adjusted their prices down to early September levels and a few have taken orders at August quotations. An attractive specification for merchant bars has been going around the market. It is reported that a Longwy mill quoted 660 francs ($39.60); a Luxemburg firm and a Lorraine maker 650 francs ($39); all f.o.b. mill. Demand for shapes and plates is dull. Prices remain unchanged.

Franc—$0.06

Several mills in the East have decided to accept orders in future for mixed lots under 10 tons. Small rolling mills which have always been dependent upon this class of business will find it difficult to meet direct competition from the powerful eastern mills.

Buying Confined

To Immediate Needs in Refractory Market—Fireclay Stronger

Pittsburgh, Oct. 30.—Current orders for fire clay and silica brick usually call for one, two or three cars each at a time, 10,000 to 40,000 brick. Occasionally a larger one is placed by a steel mill involving up to 200,000 brick, but larger orders are coming from other lines of activity such as the specification for 750,000 fire clay brick placed recently by the Duquesne Light Co. for its Colfax, Pa., plant. One inquiry now out for silica brick for immediate shipment involves 25,000 brick. Users have not been buying for stock for several months, confining their purchases to prompt needs for repairs. etc.; hence new business is spotty, being equivalent to 18 to 52 per cent of rated capacity. This condition has brought about curtailment of operations where stocks among makers are large or where they have reached the limit of shed storing capacity.

Kiln operating averages vary, some being down to 50 to 60 per cent, while others are maintained at 70 to 80 per cent. Prices on fire clay are stronger at a $42 minimum, than silica brick at the same level. The market price of the latter is $42 but on certain sized orders $43 and $44 are the levels quoted. Some small concerns, however, have quoted as low as $39 and $40 where they have wanted certain business. A small but steady demand for chrome brick is encountered although orders and inquiries for magnesite are scarce. The price on chrome is where it has been for about a year, namely $50, and magnesite is unchanged at the $65 figure reached by three declines from the $75 level within three months after the tariff was levied about a year ago, first going to $70, then to $68, and finally to $65.

Refractories

FIRE CLAY BRICK
(Per 1000 f.o.b. works)

Pennsylvania, No. 1	$42.00 to 45.00
Pennsylvania, No. 2	35.00 to 38.00
Ohio, No. 1	42.00 to 45.00
Ohio, No. 2	35.00 to 38.00
Illinois, No. 1	45.00 to 48.00
Illinois, No. 2	42.00 to 44.00
Kentucky, No. 1	42.00 to 44.00
Kentucky, No. 2	37.00 to 39.00
Missouri, No. 1	40.00 to 42.00
Missouri, high grade	50.00 to 52.00
Maryland, No. 1	44.00 to 51.00
Maryland, No. 2	40.00 to 42.00

SILICA BRICK

Pennsylvania	42.00
Chicago	49.00
Birmingham	50.00

MAGNESITE BRICK
(Per Net Ton Seaboard Base)

9 x 4½ x 2½	$65.00

CHROME BRICK
(Per Net Ton)

9 x 4½ x 2½	$50.00

Organize Sales Company

L. C. Crewe, president of the LaFollette Coal & Iron Co., LaFollette, Tenn., has become president of the Volunteer Fuel & Iron Co., now being organized under the laws of Tennessee with an initial capital of $100,000 to sell the LaFollette company's coal, surplus coke, iron ore, limestone, slag, etc. It probably also will sell pig iron in certain territories. The Volunteer company also will handle the products of other companies and probably will engage in the export business. S. S. Pratt has resigned as treasurer and assistant general manager of the LaFollette company to become vice president and sales manager of the new interest. L. H. Atkinson, New York, also is a vice president and P. W. Brooks, LaFollette, is secretary and treasurer.

Offer Manganese Ore

New York, Oct. 30.—Caucasian manganese ore now is being offered for shipment during the first quarter of next year. The asking price is 41 cents per unit, c.i.f. tidewater, for the washed grade, and 39 cents for the ordinary grade. So far there has been no demand for the first quarter, but it is thought some tonnage will come out shortly for that delivery.

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Industry Backs National Prestige

INDUSTRY and the military forces of the nation again were joined in sympathetic purpose when the American Iron and Steel institute gathered at the Aberdeen proving grounds last week as a special guest of the army and witnessed the demonstration of modern ordnance in all its varied forms. What science and engineering have done to make modern war deadly, destructive and terribly efficient in a mechanical way was impressed upon the assembled iron and steel manufacturers. American development in effectiveness and power of artillery, munitions, automotive equipment, aerial offense and defense and other branches of military proficiency today apparently has been considerable in the few years that have elapsed since the late war. The impression of Aberdeen is comforting to those who put practical considerations above abstract ideals in this day of continuing disturbed world conditions and hold that national safety only may be preserved by keeping prepared and fit for any emergency.

To this reassurance Judge Gary's words in behalf of the iron and steel industry of the country, contributed. He pledged the assistance and support of the iron and steel plants and organizations to the military forces of the government whenever and wherever it shall be necessary for the preservation of national defense. What that assistance from the greatest steel industry and productive capacity in the world signfies, can be understood from the part that American steel played in the World war, both in support of the arms of this country, as an active belligerent and also of the allied cause prior to that time. In the last analysis, the effectiveness of modern warfare, it has been shown, largely is one of steel supply and of capacity.

Judge Gary made it clear that the American army essentially is an army of peace and never of conquest. That certainly is the common American conception and ideal. But it should be of good fortune to a sadly muddled world that such an army is backed by the greatest of all steel industries. It is not too much to say the moral strength and influence of the United States in advocating the square deal and the peaceful companionship of all nations is materially increased through its industrial greatness.

Finding Work for Heavy Presses

ASIDE from the informative value of the paper on the development of heavy forgings presented by John Lyman Cox at the meeting of the American Iron and Steel institute, there is deep significance in the author's reference to idle forging equipment. He states that with the exception of the armor plate press at the ordnance plant at Charleston, W. Va., no large forging press has been built in the United States in a number of years. Moreover, the agreement for the limitation of armament practically eliminates most of the kind of work requiring heavy presses and has had the effect of halting work on a 20,000-ton forging press, which undoubtedly will remain in its incompleted state until need of it arises.

The problem of utilizing heavy armor and gun-making equipment in peace time probably is little different from that of trying to find work for shipyards, munitions plants, and other institutions that were left high and dry when war contracts were completed. However, whereas the shipbuilder or munitions maker has a chance to dispose of much of his equipment, the producer of heavy forgings has no market for his million-dollar machinery and, therefore, must keep it idle, scrap it or find work for it.

Mr. Cox's paper is remarkable in that it shows how these heavy forging presses are being employed to help solve the problems of fabricating material strong enough to meet the requirements of higher pressures and greater size occasioned by new designs. Boiler drums, gasoline reaction chambers, heavy machine beds, gyroscopic rotors, etc., are products recently adapted to the forging process.

It is likely that the rapid strides being made in the field of engineering will result in further calls for

heavy forgings. Any development in this direction is to be welcomed, because the greater the peace-time demand for forging press capacity the greater will be the nation's resources in ordnance production when danger threatens.

Commission Has Enough Work

CONSIDERABLE discussion and some conflict result from the recent recommendation for a special division of the interstate commerce commission to administer regulations for the coal industry. This suggestion was made by the federal coal commission in its final report to President Coolidge and to congress as a basis for legislation. Mention of the interstate commerce commission as the governmental agency to supervise the troublesome coal industry has met with some popular favor. In making this selection the coal commission no doubt assumed that the choice of a federal agency of such standing as the interstate commerce commission to exercise administrative powers over the coal industry would have no little appeal. In its years of administration of a statute having an important effect upon railroads, shippers and the general public, the interstate commerce commission has acquired a more substantial reputation than many governmental bodies have been able to establish.

To assume that orders of any special division of the interstate commerce commission could be issued as general decisions of that body without the commissioners as a whole going into the matter would be a violation of the statute. Matters of general investigation by the commission are passed upon by all the commissioners. Even though one or more members should be added to the commission as a special division to take care of coal matters, the other eleven members would not be content to let decisions be issued without their approval or disapproval.

Trade Balance Now Favorable

THE fears of those who early in the year regarded the rising tide of imports with grave apprehension, have been allayed by the recent trend of foreign trade. In September exports from the United States of $381,000,000 were the largest since January. Imports of $255,000,000 were the smallest since July 1922. The excess of exports of $126,000,000 completely wiped out the unfavorable balance of trade of $90,000,000 accumulated during the first eight months of the year and set in its place a favorable balance of $36,000,000.

The rise in exports is gratifying. The decline in imports is not. The great bulge in imports last spring did not carry the threat, feared by some, of overwhelming domestic markets with cheaply made foreign goods. The large bulk of the increase in imports was represented by raw materials and raw foods. Only about one-quarter of the increase was represented by finished goods entering directly into competition with American manufactures.

In other words imports rose last spring because industry was superlatively active and in pressing need of raw materials. The decline in imports denote the recession in industrial activities.

Normally exports reach their highest level in October and November. Those are the months of peak shipments of cotton and grain to European buyers. During September it is more than probable that the increase in exports reflected the beginning of these seasonal movements. It is significant that this year American exports have expanded to every important part of the world, save Europe. Imports have increased from countries including Europe. The latter has been buying less for three reasons. Its purchasing power is low because of depreciated currencies. Its people are consuming less, while its food crops are larger. With Europe again on its feet, both American exports and imports would be larger.

Farm Tool Capacity Overbuilt

PREDICTIONS during the war period that industry was being overbuilt and would have difficulty in finding sufficient business to engage its enlarged capacity when war demand had ceased have failed of fulfillment in so many cases that to a great degree they have been forgotten. The steel industry, called on to expand tremendously in the effort to supply munitions and various other supplies, seems to have found market for its increased output the past year at least.

Singularly, an industry that now finds itself overdeveloped and out of balance with present and probable future demand is one that did not expand during the war and was not engaged in war production. During the recent national meeting of farm equipment manufacturers it developed that the plants of many farm implement makers are larger than needed to meet demands and are lying idle. This is a heavy charge on the industry, unproductive capacity being a direct loss. Efforts are being made to find other lines of production which can be carried on in these idle departments.

The explanation of this condition of excess capacity lies not in development for war purposes, but in the natural growth of the country and the attainment of a condition of partial saturation of the market. When the country was relatively new and farms were being developed rapidly, demand for farm equipment was continuous. It seemed endless. Plants were developed to care for the peak demand instead of the average.

Now that farming areas are well occupied and implement demand largely is on the basis of replacements the industry finds itself with a surplus of capacity. Thus it comes about that the overdevelopment in this case has come not from the war industries but from one engaged solely in peace production.

Industry Pledged to Nation's Defense

MEMBERS of the American Iron and Steel institute, ordnance officers and other visitors are shown in the panoramic view grouped about the 16-inch gun which is the largest in this country and weighs 170 tons. The gun had just discharged a great projectile a distance of 29 miles.

AN UNUSUAL setting to the twenty-fourth general meeting of the American Iron & Steel institute was provided Friday Oct. 26 by the trip of the institute in a body to the Aberdeen proving grounds, Aberdeen, Md., to participate in the fifth annual meeting of the Army Ordnance association. The trip to Aberdeen was made by special trains which left New York following the banquet Thursday night. Something like 500 members of the institute took advantage of the invitation to visit the proving grounds and witness the demonstration arranged by the army. At Aberdeen the iron and steel men were joined by government officials, army officers and business men from various sections to swell the visiting attendance to approximately 1000. The day proved to be one of stirring experiences for those privileged to witness the display of military science in its most advanced form and was marked by several impressive incidents.

Surrounded by all the implements of modern warfare for which steel has become so indispensable, Judge Gary pledged to the army the whole-hearted support and assistance of the American iron and steel industry whenever it shall be needed and gave a grim touch to the scene that recalled the active days of war co-operation in 1917 and 1918. Judge Gary's pledge was given at a brief open air meeting before the Service club which followed luncheon.

"If it ever becomes necessary and you desire our assistance," said Judge Gary, "I answer in behalf of the iron and steel industry without any especial resolution because it is not necessary, you shall have it. We pledge to you our assistance and shall be glad to act as your auxiliary in any conflict that may arise. It would not be becoming of me to say the things we did in the last war. We make this one claim, however. During the late war from the time we were asked by the secretaries of war and navy to mobilize the iron and steel industry for use by the government if necessary and up to the close of the war, the government never asked in vain for anything manufactured or constructed from iron and steel wherever we had the capacity to produce or could do so by the expanding of our works. We never failed to respond to the request to produce the iron and steel in time to prevent any catastrophe that might have resulted from not having that material. This is our country. We have the same obligations as you have. We are proud to go with you following your leadership and meeting your demands for assistance as far as we are able."

Judge Gary said: "The American soldier stands for national defense and not for military conquest. In order to render that defense it is absolutely essential that a competent military force and development be constantly provided.

"We are proud of the fact that the army recognizes the membership of our industry as important in the defense of this great country and in the effort to mobilize our industry in time of peace for the purpose of helping to establish the means of military defense if and when it becomes necessary. Any and every country solicitous of the welfare of its people demands the establishment and maintenance of a competent military force. This is the first essential to the protection of a country and also for the prosecution of war when and if necessary to defend itself against wanton and ruthless attack. Every good citizen appreciates the fact that this country has an army much as we have, always opposed to war, always opposed to military conquest but always ready if absolutely necessary to fight everywhere and anywhere and to make perfect such defense as is needed. Our soldiers, the greatest and most competent to fight, are always strongest for peace but not to the extent of neglecting that improvement which enables them to defend their country whenever and wherever necessary. Soldiers of the United States may be depended upon to not only do their duty in guarding the country but to do it in a way to win the admiration and regard of all citizens who care for their country. Many have thought that soldiers are supposed to be fit for fighting and only for fighting. Anyone acquainted with the facts knows that a soldier always is a good business man. I congratulate those who have organized this society on the splendid work they are doing in building up a force of arms which will show itself equal to that of any army that ever existed."

Mr. Schwab followed Judge Gary with remarks in a similar patriotic vein. Major General C. C. Williams, chief of the ordnance, in behalf of the army expressed his pleasure in welcoming the iron and steel manufacturers to the proving grounds. The Assistant Secretary of War, Dwight F. Davis, introduced the speakers. He in turn was introduced by former Assistant Secretary of War Benedict Crowell, president of the Army Ordnance association. Secretary Davis stressed the close relationship between the army and industry. "Modern war is at least half business," he said.

The program at Aberdeen embraced the demonstration of modern ordnance in all forms, many possessing an effectiveness which has been greatly increased only in the short interval that has elapsed since the late war. The opening feature of the program and one of the most impressive sights of the day, was the firing of the largest

As Institute Gathers on War Grounds

piece of artillery in the United States, a 16-inch gun on barbette carriage. This gun, fired at an angle of 45 degrees, threw a 2700-pound projectile a distance of 29 miles into Chesapeake bay. Then followed the firing of a 14-inch gun on an army railway mount model of 1920, of an 8-inch howitzer model of 1920 with split trail, of a 155-millimeter gun on a self-propelled mount and of 3-inch antiaircraft guns. The latter were fired at moving balloon targets. Two 600-pound demolition bombs were dropped on the bay from a Martin bombing plane from an altitude of 3000 feet. The aviation field then was visited and bombs and equipment inspected. The different types of military airplanes were inspected and their various purposes were described by the officers conducting the party. The laying down of the smoke curtain by a bombing airplane to give a protective screen to aircraft following was shown.

An interesting feature exhibited was an amphibious gun mount consisting of a huge caterpillar tractor which proceeded into the water under traction power to a certain depth and then went forward as a floating emplacement deriving its propulsion from two rear propellers, motor driven.

The afternoon's program was presented on the main front. Here a fleet of 15 or 20 tanks, tractors, motor carriages, cross country trucks and other automotive vehicles maneuvering at a high rate of speed afforded a remarkable sight. The demonstration further included the discharge of small arms and infantry weapons of all kinds, a battery of the Sixth Field Artillery which unlimbered and fired shrapnel at fixed targets and also laid down a smoke screen, and the dropping of two 600-pound demolition bombs on the land from a bombing

RANGED to the left of the 16-inch gun is a 14-inch gun on army railway mount constructed for service in France and weighing 75 tons, an 8-inch howitzer, an 155-millimeter gun and in the distance 3-inch antiaircraft guns. A demonstration firing of the various pieces was given.

plane at a altitude of 4000 feet. In the evening, night firing was shown, including antiaircraft defense by means of airplane flares and searchlights.

The semiannual meeting of the institute again took the form of a reunion of large proportions at New York Thursday. Fully 2000, comprising most of the principal figures in the iron and steel industry of the United States and Canada, were in attendance. Those present at the banquet numbered 1290.

As usual, much of the value of the meeting transpired from the informal conversations between the individuals attending. Informal expressions revealed that the members of the institute generally regard present business conditions as much better than might have been expected. The summer reflected a decided slump in the placing of new business in the iron, steel and related markets. In the past two months a material improvement has been noted and it was felt that this improvement will become more pronounced. It generally was believed that the expression of Chairman E. H. Gary adequately summarized the situation.

One of the most impressive of the addresses on the formal program was that by Col. T. C. Dickson, commanding officer at the Watertown arsenal. He spoke extemporaneously on a new method which has been developed recently at Watertown. This is the employment of the X-ray for examining metals for defects. By the use of the X-ray, said Col. Dickson, films are obtained which show every defect in the structure of the steel under examination. The method not only makes it possible to locate all defects, but blow holes, slag inclusions, shrinkage cracks and other defects may be distinguished from each other. The method is especially useful in that it locates minute shrinkage cracks which cannot be detected by the eye.

Col. Dickson said that the valuable feature of the new method is that it locates all the defects in a casting or forging or other section, instead of only those defects made visible by cutting cross sections. It has been possible after the location of defects to redesign the castings or forgings, or change the methods of molding or forging so as to eliminate the defects.

Ancel St. John, of the Union Carbide & Carbon Research Laboratories, Inc., said that with the X-ray method it now is possible to examine a 3-inch section of steel in a half-hour's exposure. He believed that it shortly would be possible ot utilize the method for examining much thicker sections. He thought that steelmakers would benefit greatly from the use of this method of steel examination at their own plants and said that the installation of the equipment necessary involves an expenditure of about $10,000.

A splendid paper by Chung-Uu Wang, on the economics of the iron industry in China, was read by Theodore B. Tu, of Columbia university. This gave actual figures covering the iron ore resources of China, the various producing plants in China together with their equip-

(Concluded on Page 1250)

Public's Good Will Is Needed

Growing Importance of Steel Industry Requires More Vigilance to Disarm Unjust Attack—Twelve-Hour Day Pledge Fulfilled—Trade Outlook Good —Europe Can Be Aided "Only by Example"

BY E. H. GARY

HEARTY congratulations are extended to the members of the American Iron and Steel institute upon the abolition of the 12-hour day in the iron and steel industry of the United States of America!

In the dark days of military conflict no one in this country objected to 12 hours work per day. The year after the armistice, for the first time, so far as your president recollects, gentlemen claiming to represent workmen demanded with many other things abolition of the 12-hour day by the iron and steel industry. The active campaign that followed, the sometimes inaccurate representations and unjust accusations that were made, need not be mentioned, nor even remembered by those who suffered from unwarranted attack. We were helpless, for there was legitimately involved the question of propriety and desirability of continuing the 12-hour day, and we were unwilling to do or say anything which could be construed as a defense of the 12-hour day, which in our deliberations we admitted must be abrogated when and as circumstances should permit.

Now that you have concertedly, with practical unanimity and with most remarkable promptness, relegated to the past a practice you did not inaugurate, but have been willing to recognize as undesirable, you are entitled to praise for having risen to a great occasion involving, as we believe, no question of morals, but one that became a matter of public interest and concern.

In bringing about this change we have met many obstacles, some very difficult. The full facts are not generally known. It is not necessary nor would be useful to relate them at this time. We have been striving for the accomplishment of a change in business that would meet the demands of a sentiment, which was not one-sided or uncontroverted, as witnessed by volumes of letters we have received; and we are pleased and satisfied.

The outstanding factor which brought about the necessary concert of action, at the time it was secured, was the good-natured, positive influence of the President, who comprehended our difficulties, and, though he hesitated to interfere, strongly urged a change in hours simply because he deemed it a matter of duty. His manner and method convinced everyone familiar with the facts of his sincerity and friendship. He was strong because he believed he was right. He made friends, not enemies. We are glad that we gave heed to his advice and reciprocated his friendship, and that he was aware of this before his untimely and universally lamented departure for a better world.

IT IS doubtful if our government can at present be of much assistance in its attempts to restore the equilibrium of Europe. Voluntary advice or sympathy just now would not be acceptable. Practically we can be of benefit only by example.

The iron and steel business in this country has grown by leaps and bounds until it has become one of the greatest of all the large industries. We have a productive annual capacity of about 60,000,000 tons of steel. We employ a maximum of about 600,000 men, who with their families aggregate a population of 2,500,000. We transact a business of $2,000,000,000 or more annually. Needless to say, we are important in the industrial life of this country. We have a decided influence for good or bad. With this goes a great responsibility. We could not shirk it if we desired. Each one of us must share in and must render an account concerning this responsibility.

More and more the general public will give attention to our stewardship. We should not resent nor disregard honest or deserved criticism. Even though sometimes, through lack of information or because of vicious motives, there may be unjust criticism, if it is based on a fragment of the truth, there should be no objection on our part.

WE PLEDGED our co-operation with the President in the effort to eliminate the 12-hour day in our industry as soon as it should be practicable. That pledge has never been violated nor neglected nor its fulfillment unnecessarily postponed. Every one familiar with the facts will testify to the good faith and earnest endeavor of the industry.

What is the remedy? What is the protection? The answer may be stated in a few words. The affairs of every man and every line of business should be so conducted, continuously, consistently and persistently, that there could be no just cause for reproach. Even this would not absolutely prevent unreasonable antagonisms, but in the main would result in benefits that would be incalculable.

Let us make for ourselves practical application of these fundamental principles. We desire, we need, the good will of the general public. We wish for the approval and the friendship of all with whom we come in contact, including our employes, our customers, our competitors and our stockholders everywhere.

Let us always, to the best of our understanding and ability, deal justly by all these groups. Let us not intentionally give ground for reasonable complaint. Let us be considerate, fair and honest, and exercise due liberality up to the full limit of consistency and practicability.

There is, even to the dull and impervious mind, an unanswerable reason for the adoption of the principles that have been suggested. It will pay in dollars and cents. It will result in profits, not immediate in some cases, but certain, in the long run, as a general proposition. If we firmly establish the reputation which we desire and may attain, we shall build for the American Iron and Steel institute a monument of which our successors in the days to come may be proud.

The disasters of the great war are not yet appraised. The full cost is not yet known. The final effect will not be ascertained perhaps during the life of any person living when the war closed. Reparations have not been made. International enmities are at fever heat. Governments have been overthrown, still others have been threatened. Nations have become practically bankrupt. Multitudes of men, women and children have been and are starving. Even national

Address delivered at the meeting of the American Iron and Steel institute, New York, Oct. 25.

money has become valueless. European countries are drifting, perhaps some toward the rocks of destruction. Suspicion and distrust are predominant in the minds of men. Hate, revenge, brutality, crime are in evidence throughout Europe. A merciful and yet a just God has not yet disclosed to us the fate of our neighbors in Europe.

It would not be appropriate for us to take sides in European controversies nor to condemn individual attitudes or conduct; but we know the great seas are not wide enough to separate us from the influences of disaster in Europe. We are affected in our finances, our commerce, our industries, our civic, political and social life and our morals. Citizens of Europe are embarking for the United States whenever possible; not always the most worthy are included, which is a pity. Their ideas permeate our social and business life. The whole structure of civilization has been shaken.

If the European atmosphere and conditions dominated our affairs, our business men might be depressed and somewhat doubtful of the future; but fortunately they do not. We are, or at least we may be, independent of all other countries so far as business progress and prosperity are concerned. If we properly conserve and utilize our natural resources and legitimately manage our private and public affairs, availing ourselves of the opportunities that are presented, we may and will continuously and adequately prosper.

It is not necessary at this time to give facts and figures relating to the growing wealth and enlarging production and corresponding increase of income. These have been frequently referred to. If these are protected, developed and utilized we need have no fears for the future.

Need Law and Order

As all fair-minded men will admit, the first essential to the welfare and prosperity of a nation and all its people is protection, that is, safety of property and persons, the uninterrupted maintenance of law and order. For this everyone is responsible, more or less, private individuals, public officials, every department of government, municipal, state and national. For the specific administration of government affairs, responsibility is placed upon executive branches and very much depends upon the attitude and disposition of officials. Therefore, the people naturally look to the White House with anxious and hopeful eyes whenever there is a new occupant.

Almost before a sad and despondent people had recovered their sensibilities after the sudden death of their greatly beloved and universally trusted President Harding, they began to inquire more particularly into the record of the new President Coolidge.

FOR the calendar year the iron and steel industry will show considerable profit, though not as much as the capital invested should produce....It may be stated with confidence that the outlook is good....It is up to the business management in every line to take advantage of the opportunities offered.

Some, possibly many, well-meaning citizens went directly to the President and inquired of him as to his convictions and intentions. They received little information except such as they and the general public already possessed, and as to that he was very frank. However, the character, disposition and intention of President Coolidge had been registered. His record, his daily life, his principles, his innermost thoughts, had been expressed in his speeches and letters, official and private.

It may be assumed that President Coolidge will be governed by the same motives as those which have actuated an honorable and useful life. Consequently the prosperity of this country will apparently have cordial, appropriate and effective assistance from the national government, limited only by established rules and principles and the general welfare of all the people.

What is the disposition of the President concerning the affairs of the country? This is shown by a statement recently made by one occupying an official position as follows:

"It is very evidently the aim and effort of the administration to encourage in every way policies in both business and politics which will tend to the elimination of agitation. The very evident desire in all governmental quarters is to extend the fullest assistance to the constructive forces of the country. The removal of elements of uncertainty and of misgivings, and the stabilization of business conditions, are a constant aim, and the feeling among those most familiar with the reflections of the business situation is that substantial progress is being made along these lines."

THERE will be temporary interruptions, recessions and there will be fluctuations, but the man of business courage with a reasonably clear vision of the long future pays little attention to temporary hesitation in business progress. He knows that the current of prosperity in the United States is so strong that even though it may be occasionally modified by unnatural or unreasonable obstructions this will result in accumulation of volume and force which will soon be overwhelming and stronger than ever before.

If the business men will do their part and co-operate with the President and his assistants in conducting their affairs in conformity with the high ideals which we believe actuate the President in the performance of his duties as the chief executive, there is no reason to fear there will be a serious financial or commercial disturbance or depression during the next few months.

There are, as always, some hindrances to the natural progress and prosperity in the United States. Those patent to everyone are the turbulent conditions in other countries, already alluded to; the unreasonably high and burdensome taxes, national, state and municipal; the high costs of production, in some lines unconscionable; and the high costs of living, measurably, though not altogether, brought about by those who complain the most.

But there are many reasons for confidence in the economic future in this country, outside of those which are basic and permanent, including our enormous wealth and immense yearly income, which increases as the years go by.

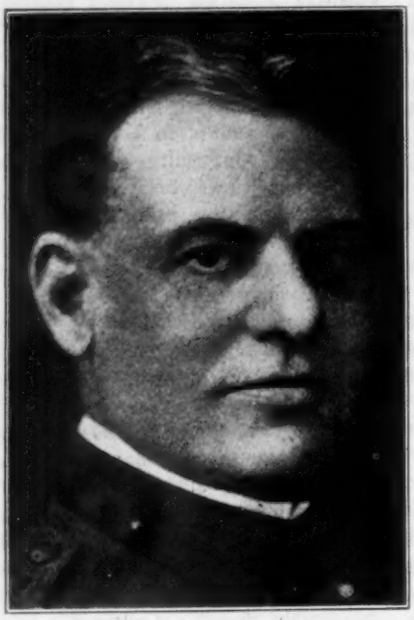
Industry Will Show Profit

For the calendar year the iron and steel industry will show considerable profit, though not as much as the capital invested should produce. The new orders are not up to productive capacity, but together with those heretofore accumulated, have resulted in large shipments. In some lines the demand for immediate consumption has been, and still is, in excess of the ability to supply.

It may be stated with confidence that the outlook is good. Inquiries for iron and steel are unusually large, many of them urgent. Purchases for railroad and general building purposes, for oil development and production, for canning purposes, for the automobile trade and many other lines are now very large as a total and from appearances may be expected to materially increase in volume during the next six months, unless something unforeseen and unwarranted shall be precipitated.

The actual purchasing necessities of our commodities are very great at present, and there is plenty of money to pay for whatever is needed. It is up to business management in every line to take advantage of the opportunities offered. Let us have faith in the future and do our part, proceeding always with good judgment, prudence and within the limits of our resources, but steadily forward toward the goal of the prosperity which we know is ahead and will be greater than ever before.

Technical Papers Record Industry's Progress



TRACY C. DICKSON

COL. TRACY C. DICKSON, commanding officer of the Watertown arsenal, Watertown, Mass., was appointed from the state of Texas to the military academy at West Point, N. Y., from which he was graduated in 1892. After two years' service in the artillery he was transferred to the ordnance department where he was subsequently engaged for five years in the manufacture, design and test of small arms for the Springfield armory. For three years afterwards he was occupied in the installation of a plant for the manufacture of rifles and mobile gun carriages at the Rock Island arsenal. Col. Dickson was next connected with the Washington headquarters as assistant to the chief of ordnance, United States army, spending four years there and at the same time designing mobile and seacoast gun carriages. Following four years of work as a member of the ordnance board and supervisor of tests at the Sandy Hook proving ground, he became a member of the staff of Maj. Gen. George W. Goethals as inspector of shops during the construction of the Panama canal. He returned to this country to assume charge of the Sandy Hook proving ground. During the war Col. Dickson held the rank of brigadier general and assistant to the chief of ordnance, subsequently becoming commanding officer of the Watertown arsenal, which position he still maintains. Col Dickson was intimately connected with the establishment and operation of the ordnance school for officers.

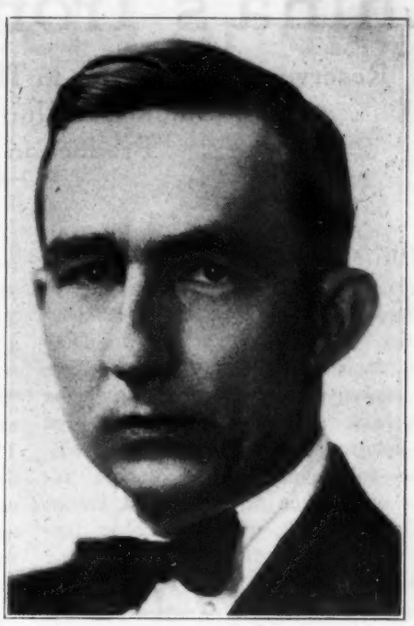
CHUNG YU WANG

CHUNG-YU WANG is a distinguished Chinese metallurgist and engineer. A graduate of the school of mines at Columbia university, in the class of 1903, and later of the Royal school of mines, London, he for a considerable period was chief engineer of the Wah Chang Mining & Smelting Co., Changsha, China. Later he became chief engineer of the Yangtze Engineering Works, Hankow. Mr. Wang attended the disarmament congress at Washington as advisor to the Chinese delegation. On his return to China he became associated in an advisory capacity with the Shantung railroad administration which was released by the Japanese to China following the Washington conference. Mr. Wang continues as chief engineer of the Yangtze Engineering Works and resides at Hankow and Peking. Mr. Wang is the author of "The Metallurgy of Antimony," the only book in the English tongue which has been published on this subject. He is a believer in spiritism and has written on this as well as on other subjects. Mr. Wang is a keen student of Chinese art and his large collection is well known to collectors. His library of books on mining and metallurgical subjects is recognized as the most complete in China. Mr. Wang is a member of the American Institute of Mining and Metallurgical Engineers, of the Iron and Steel institute, London, and of other societies.

F. B. QUIGLEY

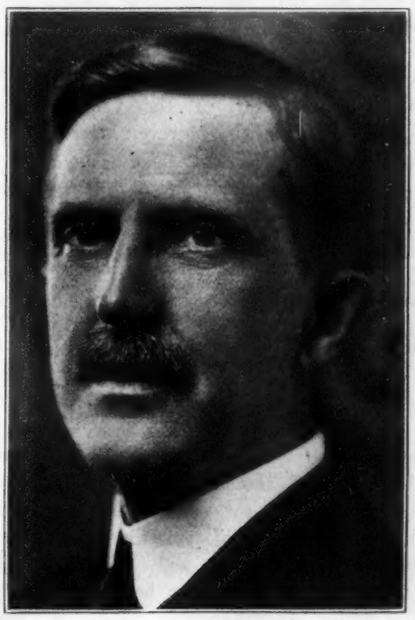
F. B. QUIGLEY, superintendent of open-hearth and bessemer departments of the Carnegie Steel Co., was born in Harrisburg, Pa., in 1885. He received his primary education at Harrisburg and was graduated in 1908 from Case School of Applied Science, Cleveland, the school of metallurgy. He immediately entered the steel industry, becoming affiliated with the Carnegie Steel Co. at Youngstown, in its blast furnace department. In 1915 he was appointed assistant superintendent of blast furnaces, and in 1922 to his present position.

Authors Discuss Problems of Wide Application



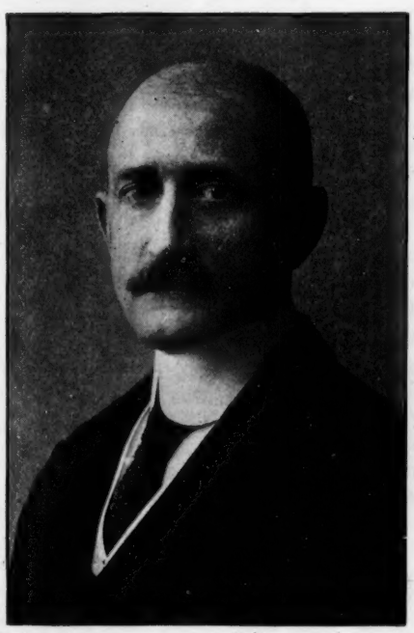
F. C. LANGENBERG

F. C. LANGENBERG, metallurgist at the Watertown arsenal, Watertown, Mass., was born March 14, 1890, at Beverly, O. He received the degrees bachelor of science and master of science at Ohio university and in 1915 received the degree doctor of science in metallurgy from Harvard university. From 1912-15 he was assistant to Prof. Albert Sauveur at Harvard. Since that time he has been metallurgist for the Watertown arsenal and director of the testing laboratories there. Since 1919 he has held the additional office of metallurgist for the ordnance department of the United States army, but despite these duties has devoted some of his time in the last four years to private practice. Mr. Langenberg is chairman of the metal specification board of the ordnance department, a member of committee A-9 on ferroalloys of the American Society for Testing Materials and chairman of the subcommittee on testing of the phosphorus and sulphur committee. In 1921 he was a Carnegie research scholar. Among the articles which Mr. Langenberg has contributed to the scientific publications are: "Minor Metals and Military Preparedness," "Cementation by Gas Under Pressure," "Comparative Shock Values of Steel after Varied Heat Treatments," "Impact Tests on Cast Steel," and "Planning and Routing of Forging and Heat Treatment Work at Watertown Arsenal."



C. L. McKENZIE

C. L. McKENZIE, president of the Duquesne Slag Products Co., Pittsburgh, was born at Montrose, Pa., and was graduated from Lehigh university in 1893 as a civil engineer. Some of his earliest work was spent in surveying, planning maps and construction work. He made his debut in the iron and steel industry as a member of the designing department of the Shiffler Bridge Co. and later became eastern sales agent and then assistant general manager of that company. In 1899 Mr. McKenzie became assistant to the Pittsburgh district manager of the American Bridge Co. Since 1901 he has been president of the Pittsburgh Construction Co., erector of railroad bridges and steel structures, etc. In 1906 he became manager and treasurer, later vice president and subsequently president of the Duquesne Slag Products Co. Mr. McKenzie is president of three corporations and vice president of another. Mr. McKenzie's contribution to the recent meeting was a paper on "The Use of Blast Furnace Slag for Various Construction Purposes."



JOHN L. COX

JOHN LYMAN COX, assistant to the president of the Midvale Co., Nicetown, Philadelphia, was born in Philadelphia in 1866. He was graduated in 1887 with honors at Stevens Institute of Technology as a mechanical engineer. Since 1888 he has been employed in various capacities in the Midvale Co.'s plant at Nicetown, having been in charge, at one time or another since then, of the armor, projectile and research departments and more recently has been assistant to the general superintendent. Mr. Cox has taken out a number of patents on the manufacture of steel, armor and projectiles.

Besides the paper on "Recent Developments in Steel Forging" presented by Mr. Cox at the recent meeting, he has contributed various other papers to previous sessions among which was that of "The Relative Merits of Forming Steel by Pressing, Hammering or Rolling," and a discussion on stainless steel.

China's Iron Deposits Are Small

Reserves Only Quarter to Third Usual Deposits for Equal Area—At Per Capita Rate of Consumption in United States, Four Years Would Exhaust Resources—Production Costs Slightly Under That of America

BY CHUNG-YU WANG

INDICATIONS show that the people of the United States have awakened to the idea of the great possibilities of foreign trade in the Far East. It is hoped this paper may further awaken their interest in one of the great basic industries of a nation—the iron industry in China.

The following estimate of ore reserves of the iron deposits so far known in China, suitable to modern blast furnace work as regards type, character and situation (excepting those scattered and unimportant sedimentary deposits found in almost all of the provinces of China, which may amount to 300,000,000 tons and which are only adaptable for native furnace work) shows the quantity to be in the neighborhood of 600,000,000 tons.

The iron ore reserves, as estimated by V. K. Ting, director of the Chinese geological survey, with, however, minor alterations, are as follows:

Provinces	Iron ore	Theoretical iron content
Chili	86,469,000	42,896,000
Fengtien	287,580,000	105,205,000
Shangtung	22,920,000	14,138,000
Honan	3,400,000	1,640,000
Anhwei	27,500,000	13,525,000
Kiangsu	**39,080,000**	**20,787,800**
Hupeh	52,687,000	30,095,000
Kiagsu	39,080,000	20,787,800
Fukien	15,000,000	7,000,000
Chekiang	2,300,000	1,050,000
Total tons	555,196,000	245,107,800

If the 300 million tons of scattered and unimportant sedimentary deposits are included, we find that China has about one twenty-fifth of the reserves of the world, one-fourth that of America, eight-tenths that of England and one-third that of France or Germany before the war. Looking from another angle, if we should take the per capita consumption of iron in China to be equal to that in the United States, that is 600 pounds per capita, based upon prewar production, we would have to face the consequence of exhausting the 900 million tons of ore in about four years.

Ore Deposits Relatively Small

It has been assumed, first by Sjorgren and then by Eckel, that the resources of iron ore of known countries are proportional to their areas, that is 1646 tons of ore per square mile of territory. Now, taking the combined areas of China proper and Manchuria to be 1,896,000 square miles, we should expect to have, according to the above assumption, about 3,120,000,000 tons of iron ore as reserves. In reality there are only about 900,000,000 tons, that is about one-third or one-fourth what there should be. The annual production of pig iron by the modern furnaces in China will soon reach the 1,000,000-ton mark, if the iron market continues to improve and if the concrete proposals that have been made soon materialize.

The following is a list of iron works existing or proposed, with their maximum production and their present production:

Name of company	Maximum annual production	Estimated production for 1923	Remarks
Han-Yeh-Ping Co..	216,000	100,000	
Han-Yeh-Ping Co..	324,000	90,000	
Liu-Ho-Kou Mining Co.	36,000	30,000	
Pen Hsi Hu Coal & Iron Co.	91,000	20,000	
Lung Yen Co.	90,000	.....	Will be blown in next year.
Kai Lan Mining Administration	*90,000	.....	Under consideration.
Anshanchan	100,000	*20,000	
Total, tons	947,000	260,000	

*Estimated.

It is well known that pig iron is still produced in small native furnaces in nearly all of the provinces of China. An estimate of the approximate production of ore and native pig for the year 1915 gives 499,810 tons for the former and 108,330 tons for the latter.

Regarding the conditions making for the curtailment of production at the present time, I shall have a word to say later on.

The chemical composition of Yangtze foundry pig iron No. 1 (Liu-Ho-Kou Co.) is silicon 2.50 to 3.00; sulphur 0.03 maximum; phosphorus 0.05 to 0.15 and manganese 0.50 to 0.70 per cent. Han-Yeh-Ping Co., iron No. 1 contains silicon 2.00 to 4.00; sulphur 0.03 to 0.08; phosphorus 0.25 to 0.33; and manganese 0.60 to 2.00 per cent. Pen-Hsi-Hu iron No. 1 contains no silicon; sulphur 0.012 to 0.047; phosphorus 0.07 and manganese 0.40 per cent.

Regarding the cost of mining iron ore in China, it is apparent that this will vary according to location and type of ore deposit. Let us take the Tayeh iron mine as a representative type of mining on a large scale. The cost of mining and transportation (about 28 kilometers from the mine to port of shipment) was about $1.00 Mex.* per ton in 1913, itemized as follows:

	Taels
Salary	0.154
Labor and material	0.241
Transportation	0.074
Loading	0.112
Miscellaneous	0.143
Total	0.724—approximately $1.00 Mexican

Ore Contracts With Japan

In 1919, due to rise in cost of material and labor and including interest and depreciation, the cost per ton at port of shipment was $2.80 Mex. The present cost varies slightly around this figure.

The cost of mining in the various small and scattered deposits in Hunan, to supply ore to the native furnaces, varied from $0.672 Mex. up to $3.36 Mex. per ton.

It will be interesting to you to know the conditions under which contracts for ore delivery have been made in China. Japan has been the largest buyer of Chinese iron ore, the quantities ranging from 300,000 tons to 600,000 tons per year. Under the terms of an agreement with the Han-Yeh-Ping Co., involving a series of long term loans from Japan, there are specified the following restrictions as to the grade of ore to be delivered, f.o.b. steamer at Tayeh at $3 (Mex.) per ton, with 5 per cent additional for shortage: Iron content based at 65 per cent; for every increase of 1 per cent, a premium of 10 cents Mex. is given; for every decrease of 1 per cent, a deduction of 10 cents Mex.; refusal, if 50 per cent or less. Manganese content based at 0.5 per cent; for every additional 0.1 per cent, a premium of 10 cents. Phosphorus, at 0.05 per cent; for each decrease of 0.01 per cent, a premium of 10 cents; for each increase of 0.01 per cent, a deduction of 10 cents; refusal, if more than 0.08 per cent. Sulphur, 0.1 per cent; for each additional 0.1 per cent a deduction of 5 cents; refusal, if more than 0.5 per cent. Copper, 4 per cent; refusal if more than 0.4 per cent. The average sizes of ore should be between 75 millimeters and 150 millimeters; and any sizes less

(*Continued on page* 1244)

From a paper presented at the meeting of the American Iron and Steel institute at New York, Oct. 25. The author is head of the technical department of the Liu Ho Kou Mining Co., Peking, China.

*$1.00 Gold = $2.00 Mex. = Ts. 1.45.

Producing Heavy Steel Forgings

Larger and More Powerful Units of Machinery Make Size of Forgings or Castings Limiting Factor in Design of Parts—Alloy Steel Increasing in Favor for Large Forgings

BY JOHN L. COX

ENGINEERS designing machines requiring parts of unusual size or operating under unusual stresses often are confronted with the question whether or not such parts are practically obtainable. Steam turbines of 87,000-horsepower and boilers bearing pressures of 1200 pounds per square inch have supplanted units of smaller capacities and pressures. In many other directions units are being designed with parts exceptional in size or quality, which must be submitted to the steel manufacturer before confidence can be obtained that such parts will be procurable.

From a paper presented at the meeting of the American Iron and Steel institute, New York, Oct. 25, 1923. The author is assistant to the president, Midvale Co., Philadelphia.

Again, a knowledge of the obtainable may make possible designs employing steel forgings to advantage in parts of great size and weight, or encourage the growing tendency to employ the alloy steels in place of carbon steel in highly stressed forgings, or influence a decision in favor of using hardened and ground forged alloy steel in rolls for cold-rolling metals.

Alloy Steel Forgings

Chrome-nickel steel for many years has been made into plates of great size, by the companies manufacturing armor, and most elaborate heat treatments have been devised to produce in them the qualities necessary for successful ballistic test. For this use, advantage has been taken of the exceptional toughness of this alloy steel rather than its possibilities for high tension test figures, which are those largely employed in the manufacture of parts for automotive engines. Today, industry is availing itself of the widely variable properties of this alloy, or similar alloys, in forgings of considerable size.

A notable instance of this is in the recent introduction of the use of chrome-nickel steel for columns of hydraulic presses, where carbon steel proved too weak and it was impossible to increase the diameters. Such columns are in successful operation today as large as 24 inches in diameter and

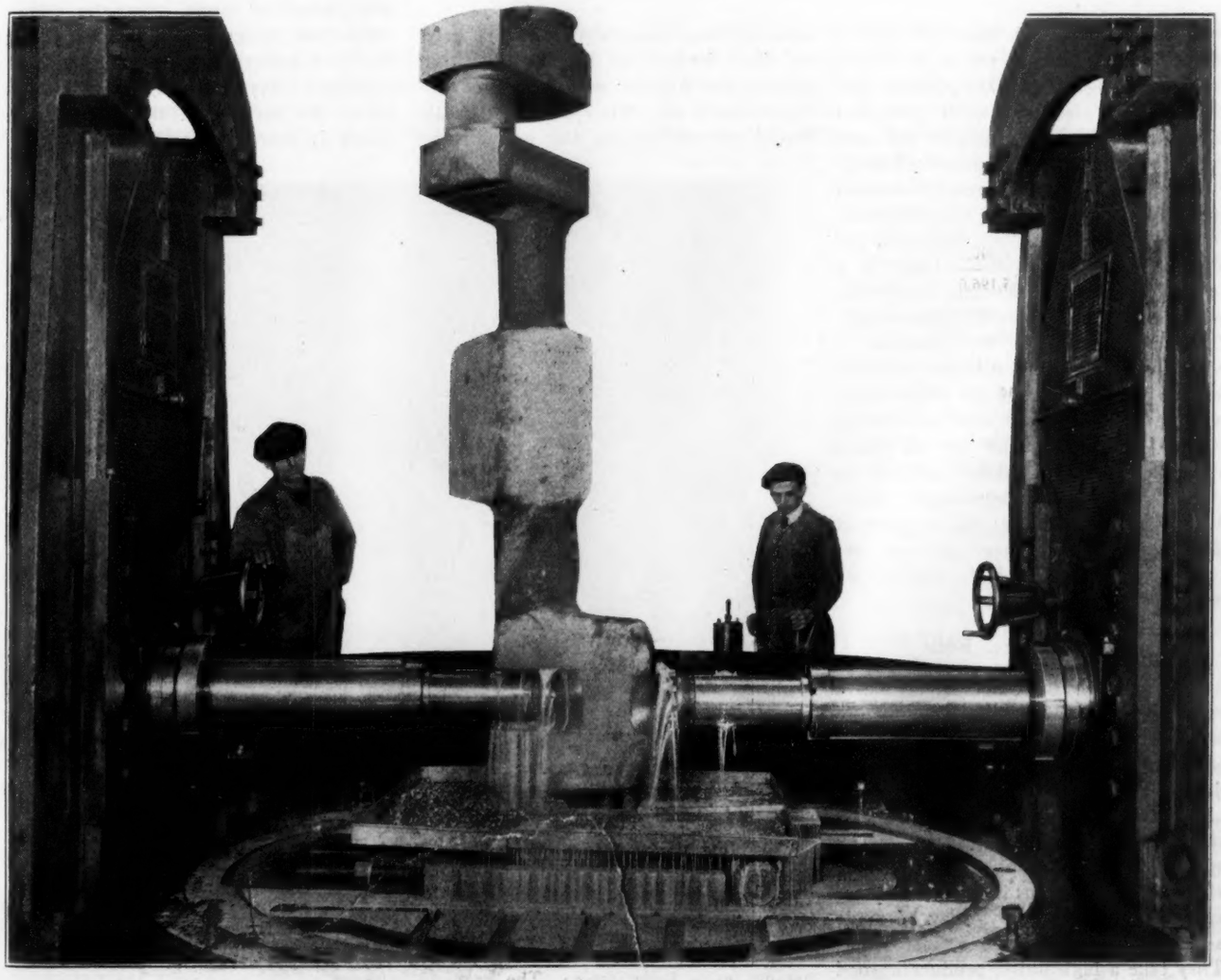


FIG. 1—OVERGAARD-TYPE CRANK MILLING MACHINE IN OPERATION

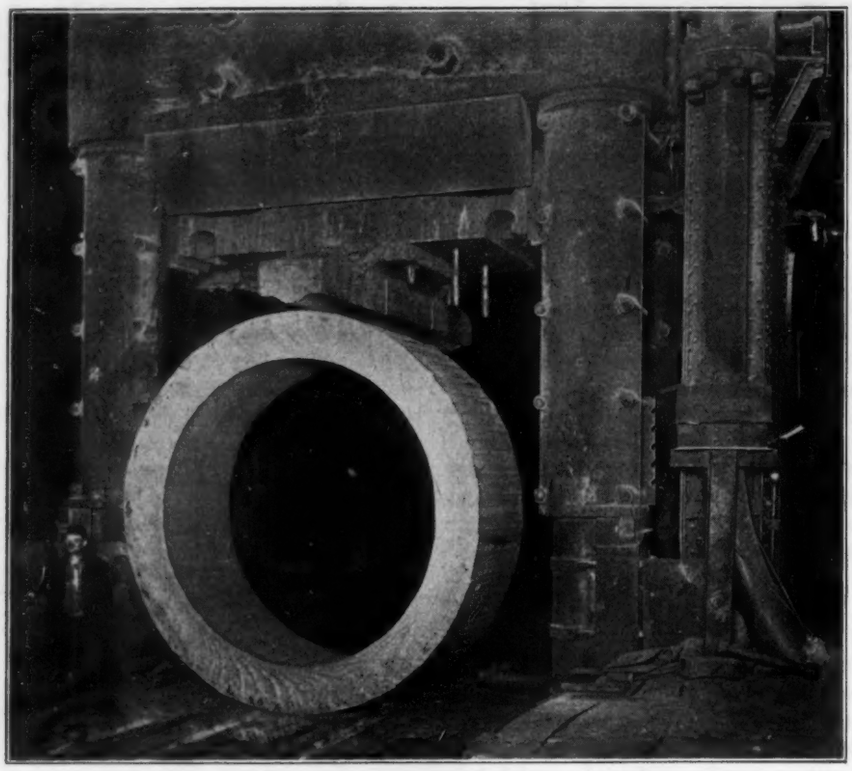


FIG. 2—A LARGE EXPANDED RING UNDER FORGING PRESS

over 36 feet long. A treatment giving about 115,000 pounds per square inch tensile strength, 85,000 pounds per square inch yield point, 21 per cent elongation in 2 inches and 55 per cent reduction of area, has answered well.

Chrome-nickel and chrome-vanadium steels find employment in a recently constructed 32-inch built-up container for an extrusion press. The liner is a forging of chrome-vanadium steel fully heat-treated and moderately drawn back. The inner member of the container is of chrome-vanadium steel of 110,000 pounds yield point and the outer member of chrome-nickel steel of 130,000 pounds yield point, the several pieces assembled under shrinkage similarly to a built-up gun, so that when the appliance is working under full pressure of 47,400 pounds per square inch no part bears over 61,000 pounds per square inch fiber stress.

Hardened Steel Rolls

Another interesting field in an active stage of development is the manufacture of hardened steel rolls. The rolls usually are heat treated, hardened slightly drawn, ground and polished and are of alloy steel, usually chromium, chrome-vanadium, chrome-molybdenum, chrome-vanadium-molybdenum, or chrome-tungsten-vanadium. Fully hardened rolls of these alloys may be made as hard as from 110 to 115 scleroscope. They take a high finish, produce a good surface on the product, and are reasonably long lived if treated properly, as they deserve to be, for they are among the highest expressions of the steelmaker's art. They must not be allowed to run hot on the journals, or they may crack there; must not be struck on the working surfaces, or they will indent in spite of their hardness; must not be allowed to slip on the work, or local heating may cause spawls; must be kept slushed, or rust will ruin their mirror finish. Small rolls of this type have been on the market for many years, but as experience in their manufacture is being acquired and their merits are becoming appreciated the sizes are increasing. Today rolls about 25 inches in diameter by 40 inches in length of body are readily supplied in the hardest grades, and rolls as large as 28 inches by 120 inches can be furnished with scleroscope readings of about 80, or over. No doubt, in time, skill and equipment will be available to produce these large rolls with a scleroscope hardness of over 100.

Hardness Depends On Use

The exact degree of hardness desirable in such rolls depends considerably upon the character of the work to be done with them. A roll reading 95 to 100 scleroscope will far outlast a roll reading 110 scleroscope on certain classes of work, especially where much heat is generated, as in rolling zinc or roughing soft steel, for the heat generated may locally expand and spawl the surface of the harder roll, which is more immobile in character.

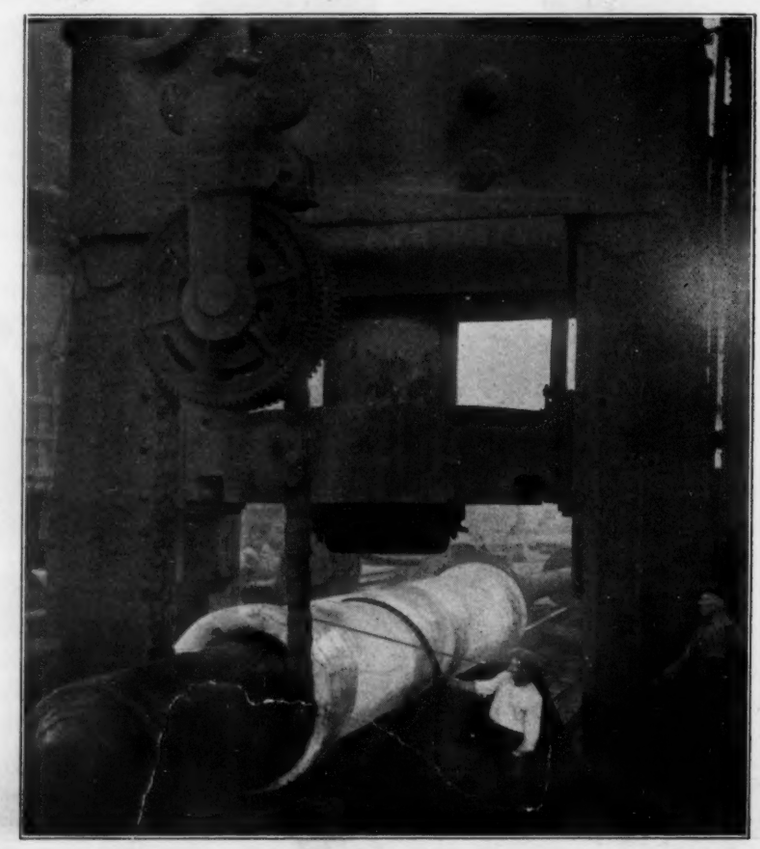


FIG. 3—A GASOLINE REACTION CHAMBER ON FINISHING MANDREL

In some cases, remarkable results have been secured in rolling hard wire by the use of properly designed rolls of high-speed steel. Though not so hard by the scleroscope as the other type, Brinell readings are disproportionately high, and the metal of the roll does not indent and groove as readily as does the harder metal of the usual compositions.

Making Heavy Crankshafts

While no new principles have been developed in the manufacture of crankshafts of which the author is aware, their production has been much facilitated by a new machine tool invented in Denmark. It consists of two opposed milling heads on horizontal shafts carried by housings, each with three adjustments and feeds at right angles to each other. Between them, over a pit, is a driven table provided with vise jaws adjustable toward each other and with reference to the axis of the table. Clamped between these jaws in a vertical position, adjusted properly with reference to their axes, the pins and webs of a crankshaft can be machined all over by the revolving cutters controlled by the feeds provided by the housings or by the revolution of the table. Great economy in the time of machining is obtained. The machine is shown in operation in Fig. 1.

In the production of hollow forgings of great diameter and short length, there has been little change for many years, but it may be of interest to show what has been done in this line. Fig. 2 shows such a forging on the completion of its expansion. This particular ring is 137 inches outside diameter, 109 inches inside diameter and 45 inches long, weighing 85,000 pounds.

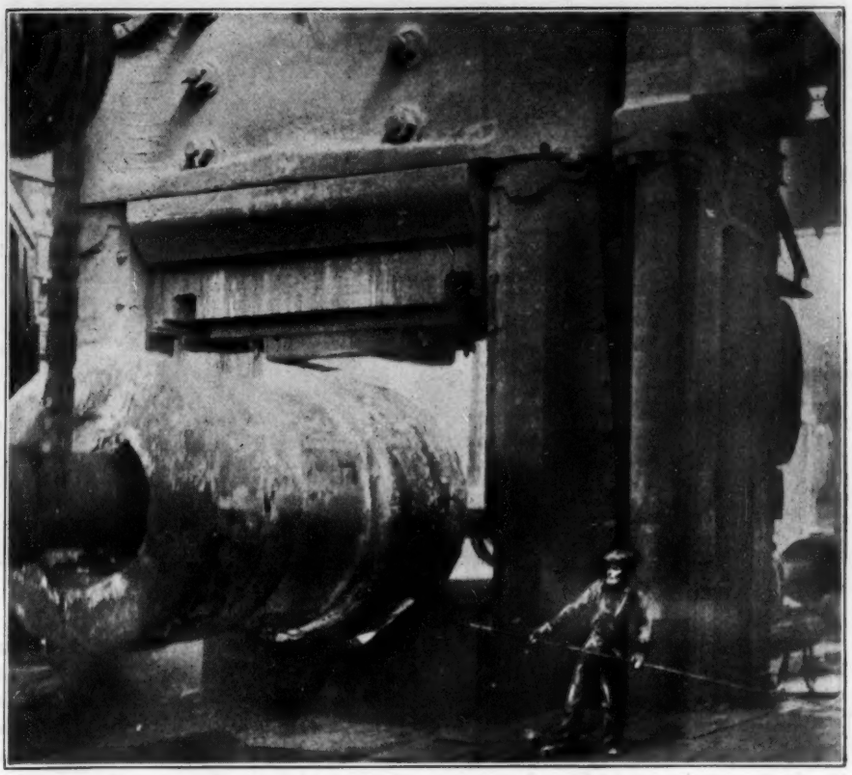


FIG. 5—A BOILER DRUM ON A ROUGHING MANDREL

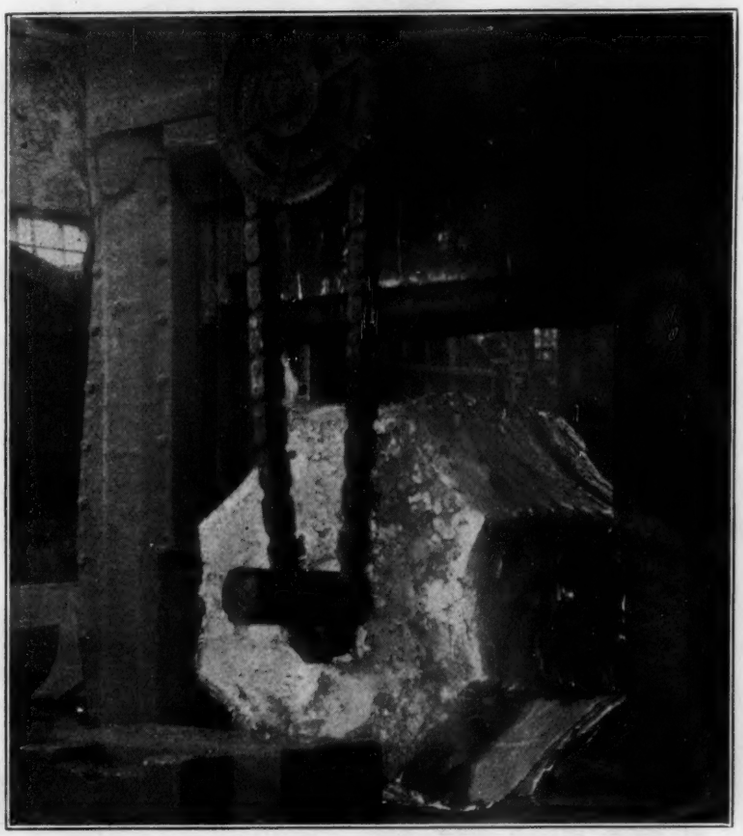


FIG. 4—PUNCHING A BILLET TO BE DRAWN INTO A BOILER DRUM

Interesting developments have been made in the field of large hollow drawn forgings. Recently means have been devised for increasing the yield of gasoline from crude oil by the application of cracking methods. Depending upon the original character of the oil, this increase may be as much as 13 fold. The oil is heated to about 875 degrees Fahr. under 500 to 600 pounds pressure while circulating through tubes in a furnace, and flows to a large insulated cylinder where the completion of the cracking operation takes place.

Forgings Must Be Perfect

This cylinder, or reaction chamber, must stand heat, pressure, corrosion by sulphur in the oil, and be absolutely leak proof, for the gasoline under high pressure is well above its ignition point. The use of forged steel cylinders for this purpose has met with signal success. One of the first types, which was designed by Dr. Cross, was 46 inches outside diameter, 38 inches inside diameter and 36 feet 11¼ inches long in the body, weighing 52,000 pounds in the rough. The ends were closed by heads and covers of cast steel, secured by heat-treated nickel steel bolts and nuts. There was no leak under 2000 pounds hydrostatic pressure applied for eight hours.

The disadvantages of a separate head

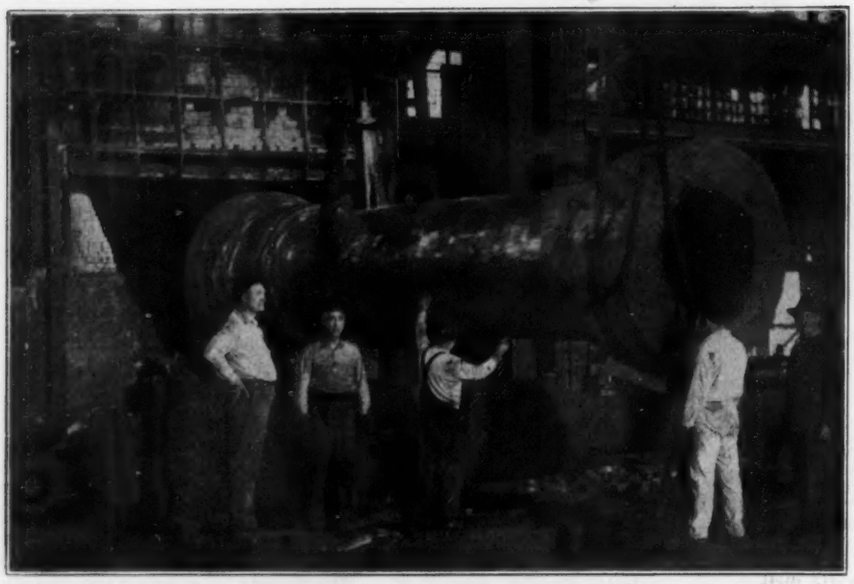


FIG. 6—A BOILER DRUM PARTLY FINISHED, PREPARATORY TO REHEATING

were so evident that it was next sought to make the head integral with the body. This was successfully accomplished by forging the slope, neck and flange at each end in one piece with the body, as shown in Fig. 3.

The Babcock & Wilcox Co. is building a high-pressure boiler for the new Weymouth station of the Edison Illuminating Co. of Boston. This boiler has approximately 19,743 square feet of heating surface and will furnish about 110,000 pounds of steam per hour at a maximum pressure of 1200 pounds per square inch. The cross drum of this boiler is a forced steel cylinder 48 inches inside diameter, 56½ inches outside diameter and 34 feet total length over the ends, which are closed in to take a 12 by 16-inch manhole cover.

Method of Forging Ingot

This is one of the largest hollow forgings ever made; the forged weight is 162,000 pounds, requiring an ingot of 262,000 pounds to allow for scrap and losses. The billet was cut hot from a 78-inch octagon ingot, was stood on end and upset to about 96 inches in diameter, had a 23½-inch core removed with a hollow punch, was expanded to about 50 inches in inside diameter, drawn on a mandrel to 45 inches inside diameter, 58½ inches outside diameter, annealed, tested, machined inside and out, and after closing-in is to be reannealed, have the throat machined to 11¾ inches inside diameter and the exterior of the head trued up. Fig. 4 shows the billet under the press after punching and before expanding; Fig. 5 shows the forging on the roughing mandrel and Fig. 6 shows the partly finished forging on its way back to the furnace for reheating. The author believes that with the single exception of the new armor plate press at the idle naval armor plant at Charleston, W. Va., there has been no very large forging press built in the United States for a number of years and the agreement for the limitation of armament, by practically ending for 10 years the manufacture of armor plate and heavy guns, makes improbable any increase of their number in the immediate future. However, this lack of material progress has been offset by a great increase in manipulative skill, so that today it is possible to handle large masses and produce forgings of unprecedented dimensions with the equipment at hand.

Forgings May Have Cracks

Experience has shown, both in England and the United States, that solid forgings of large diameter, even of soft steel, may contain internal transverse cracks cutting across the axis, and sometimes running to within a few inches of the surface. Such forgings might drop in two in the lathe when deeply turned, although apparently perfectly sound had less metal been removed. If proper precautions be taken in casting, handling, forging and treatment, such cracks are not produced, but as a check upon the makers the most enlightened buyers of such large forgings are today requiring the drilling of an axial hole in diameter sufficient to permit the introduction of a bore searcher (2 inches is about the minimum diameter) by which the interior surface of the mass can be easily viewed

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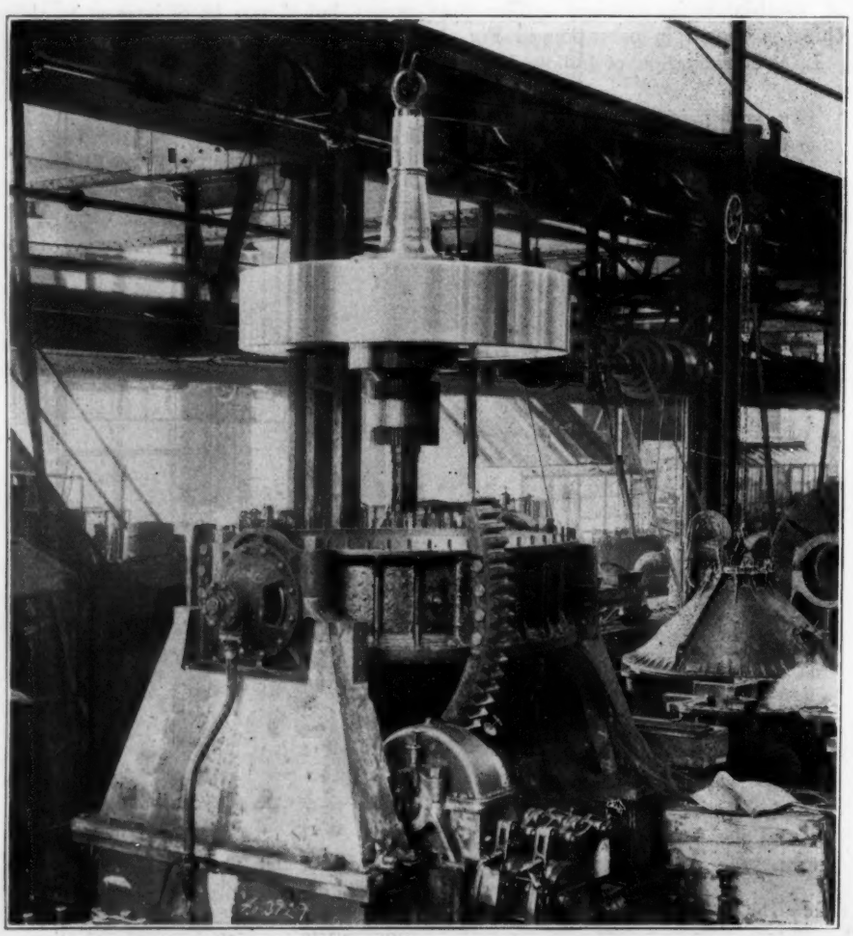


FIG. 7—A GYROSCOPIC STABILIZER MACHINED FROM A LARGE FORGING

Using Slag in Construction Work

By-Product of Blast Furnaces, Estimated at 20,000,000 Tons Annually, Is Finding More Extensive Use in Concrete Construction and Road Building—Service Performance Has Been Satisfactory—Educational Program Under Way

BY C. L. McKENZIE

PIG iron produced annually in the United States is nearly 40,000,000 tons. Therefore, it is closely approximate to estimate the total amount of blast furnace slag produced in a year at 20,000,000 tons. This 20,000,000 tons must be taken away or the furnaces must stop making pig iron. It might be well to consider a few figures in order to visualize what this quantity means. If put into the form of granulated slag and piled on the space occupied by the Woolworth building, nearly an acre, it would reach up 3½ miles, or about 22 times as high as the Woolworth tower.

A more practical illustration is to say that spread out level to a depth of 24 feet, it would cover 640 acres, or 1 square mile. Since, with rare exceptions at present no low lying waste ground is available close to the furnaces, it follows that to dispose of the material in fills, or dumps, it would either have to be transported considerable distances, or piled up on ground already at usable levels. Land near the furnaces has a value on the average of $5000 an acre. Thus the wasted slag would cover up more than $3,000,000 worth of land each year. Or, since it would be impractical to use land close to the furnaces, the 20,000,000 tons would have to be loaded, transported, and unloaded at a considerable distance from the furnaces. Probably the greater part of it now is hauled distances exceeding 3 miles and great quantities travel 10 miles, 50 miles, and more.

Slag Disposition Is Costly

It is probably conservative to estimate $1 a ton as the present average cost of such a movement or the figure that will be reached within a few years. It involves also great investment in railroads and other means of transportation and handling. If no other means of disposition were found than to haul it away from the furnaces into wasting dumps, we therefore arrive off-hand at a cost item of $20,000,000 yearly, which suggests the following questions for solution: first, how can some of this loss be avoided; and, second, how can it be prevented from increasing rapidly in the future.

Conservation of wastes is a popular subject of discussion, and, presumably, even though it means no saving in money, manufacturers of the present day would favor turning this vast quantity of blast furnace slag into a product useful to the community at large. With the added incentive of a considerable saving, the subject of blast furnace slag should become more interesting. As is fairly well known, slag has many valuable qualities and is readily adaptable to a variety of construction uses. Progress in applying it to useful purposes in construction has reached a point where more active help from blast furnace operators would show rapid results in the direction of increasing the quantity removed by this method of disposition.

A Problem for Furnace Operators

First of all, obviously, blast furnace operators must know the uses to which slag now is put, how successfully it serves, how much is being used, what needs to be done to increase its use and to overcome resistance to its use, and what the total consumption probably might become. Then, to determine the policy to be pursued, the operator must reach conclusions as to whether these commercial, constructional developments promise enough to justify backing them up by treating the slag more as a by-product and less as a waste incident to the manufacture of pig iron.

Slag is the second greatest product of a blast furnace. Without questioning that the purpose of the blast furnace is to produce pig iron, it has been suggested seriously that it will pay to consider also the value of this second product. It would seem natural that blast furnace operators should support and encourage, as far as possible, every sound agency for slag disposition, particularly if the development is in the direction of present or prospective economy.

Prior to the beginning of the present century, only insignificant quantities of blast furnace slag were used in construction. In eastern Pennsylvania, and occasionally elsewhere, as far back as 1880, small quantities were used in unimportant concrete construction, and, of course, it was used in crude form near the furnaces to make paths and driveways, just as any handy waste material would be used. Some of these roads, or driveways, remained years afterward to prove the durability of slag as a road-making material. One eastern cement company has used more than 125,000 cubic yards, beginning when building its plant in 1895, in concrete construction which still stands and includes the foundations under heavy vibrating machinery and the walls, floors, etc. About this same time, 1895 to 1905 many of the steel companies began to use it in large quantities in concrete, at Birmingham and Ensley, Ala., at Pittsburgh, Johnstown, Pottsville, Reading and Lebanon, Pa., at Youngstown, Cleveland and Lorain, O., at Mayville, Wis., at Chicago and later Gary and several other plants. At one or another of these plants, it was used in concrete of about every type of construction for which concrete can be used; heavy and light mass foundations, including those under blast furnaces, walls and floorslabs, sewer pipes, coke ovens; stacks including one 290 feet high; water tanks and dams, exposed to dry hot atmosphere and to alternate drying and wetting, or to alternate boiling and cold water, and to all weather conditions with alternate freezing and thawing. However, the chemists and engineers demand laboratory tests extending over many years. They are not all convinced that there is nothing in the slag that can be classed as a deleterious material, which may cause deterioration of the concrete. Then the outside market was cultivated for high way construction and other purposes and the increase in the use of air-cooled blast furnace slag has been considerable, this development practically having taken place within the last 20 years.

Cinder Scrap Is Salvaged

The excavating, crushing and screening plants that prepare air-cooled blast furnace slag for market now are usually known as "commercial" slag plants. One important item to remember is that the commercial slag plant equipment includes magnetic separators. With these and by hand, there is a recovery of the scrap iron or "cinder scrap," amounting in some cases to as much as 2 per cent and on the average to at least 0.5 per cent of the weight of the slag. At present prices this would mean a saving to the furnace companies of more than $500,000 annually.

At present the yearly output of commercial slag plants in the United States

From a paper presenetd at the meeting of the American Iron and Steel institute, New York, Oct. 25. The author is president, Duquesne Slag Products Co., Pittsburgh.

is about 7,000,000 tons. Of this, the subdivision will average about as follows:

	Per cent
Road and street building (other than concrete)	45
Railroad ballast	25
Aggregate in concrete	25
Roofing	1
Miscellaneous, cement concrete blocks, bricks, etc.	4

To show that there is opportunity for further expansion, consider cement concrete for example. In the district within shipping distance of the slag crushing and screening plants, the total amount of cement concrete placed each year will average at least 40,000,000 cubic yards. Air-cooled blast furnace slag is used as the aggregate in about 1,750,000 cubic yards of this. In the 20 years of development about 20,000,000 cubic yards of concrete have been built, using air-cooled blast furnace slag as the aggregate, with a remarkable absence of reports of failure—in fact, practically a total absence of such reports. Without going into statistics, a few instances can be cited to prove the success of slag in concrete.

The National Slag association has assembled partial records of various kinds of construction in which slag has been used. In reinforced concrete buildings, a partial list shows 506 structures of concrete in which approximately 900,000 tons of air-cooled blast furnace slag was used.

No Deterioration Is Found

In Cleveland 2,000,000 cubic yards of slag concrete stands as evidence in form of office buildings, warehouses, bridges and similar important structures. One of these buildings is the plant of a company making automobile bodies. The 6-story building is of reinforced slag concrete in which 50,000 tons of slag was used. One 4-story reinforced concrete office building in Cleveland was torn down after 15 years' service and, although closely inspected, showed no deterioration of concrete, or corrosion of inclosed reinforcing steel.

In Philadelphia, in addition to hundreds of miles of slag concrete in pavement foundation, there are dozens of office buildings, warehouses, etc., made of slag concrete, one of them a manufacturing plant, a city block in area, six stories high, requiring 30,000 cubic yards of concrete. Here, also, a few years ago a 16-year-old reinforced slag concrete office building was torn down and, though carefully inspected, showed no deterioration of concrete or reinforcing steel.

The Slag association also has a partial list of the slag concrete bridges in the United States numbering 56, requiring 150,000 cubic yards of concrete. These structures are of all sizes, from short spans over streets and creeks to structures one-half mile long requiring 30,000 cubic yards of concrete.

As an illustration of heavy service, the Curry Hollow Arch on the Monongahela Southern railroad contains 23,000 cubic yards of concrete in the 50-foot arch spans, on which there is a double-track railroad fill more than 100 feet deep. Other structures on this industrial railroad line, in which slag was used as the aggregate in the concrete, amounted to 100,000 cubic yards, including one retaining wall about 50 feet high. Slag concrete was used also in lining the 1800-foot double-track.

Another use for which large quantities have been required is in railroad ballast. In 1920 the slag association compiled a list of 40 railroads, all of which were using more or less air-cooled blast furnace slag for ballast and at that time were consuming at an average of about 1,750,000 tons per year. The largest users were the railroads in the South, but some of the northern roads are now using more, so that at the present time the tonnage used by the roads in western Pennsylvania, Ohio, Illinois, New York and West Virginia may exceed the amount used in the South.

The bibliography of slag has grown extensively in the last few years with reports and discussions of numerous tests, practically all of them showing favorable results for slag as compared with other commonly used materials. In addition to tests and reports by 30 or 40 private laboratories and university laboratories, state and city laboratories, literally thousands of tests have been made by the United States bureau of standards the United States bureau of roads and the Lewis institute. Many of the results and several important discussions already have been published, but much important data will be forthcoming during the next year and later.

As one or two more illustrations of possibilities, it may be mentioned that in addition to similar use in numbers of smaller installations, 75,000 tons of air-cooled blast furnace slag was used in the Akron sewage disposal plant to constitute the purifying beds, and 66,000 tons in a similar plant at Canton, O. The results of exhaustive tests of the slag used on one of these jobs were summarized by the consulting engineer in the words: "I am forced to conclude that the slag is a resistant material to both the disintegration by frost or acid sewage and in my opinion it is safe to use for construction of sewage beds."

In other classes of road building, as shown by the statement given hereinbefore, 3,000,000 and more tons is the ordinary present consumption. To illustrate how the consumption can grow, one comparatively new and little known type of bituminous slag paving made of slag sand has been used to cover the equivalent of 200 miles of improved 18-foot highway in one county, and something over the equivalent of 400 miles of 18-foot highway of this one class alone has been laid in the United States in the six or seven years since it was introduced.

Air-cooled blast furnace slag has been used successfully in every common type of road construction, including water-bound macadam, bituminous macadam, premixed bituminous concrete, the penetration type of roads and in various special types. The least experience has been had with single course, or top wearing course of concrete highways, in which slag is used as the aggregate. There are, however, in existence some 200 to 300 miles of these highways, some of which are eight and 10 years old. The service results have been satisfactory. However, the state highway departments, in general as yet do not favor slag concrete for wearing surface.

Cement Industry Heavy Consumer

In the granulated form, blast furnace slag finds less but still valuable uses in several ways, most of which have not developed far but promise much. One use that has been definitely worked out is in the manufacture of portland cement, which requires in the established factories about 1,000,000 tons of granulated slag yearly. Its success here is no longer questioned: With the recent great increase in number of portland cement manufacturing plants and corresponding producing capacity, it may be a long time before a great increase in consumption of slag for this purpose can be expected.

Probably another million tons is used to make driveways and back country roads, where traffic is not heavy and where lowest cost is essential, and for similar less important service. There is promise in preliminary results that successful building blocks and bricks can be made of granulated slag with an admixture of a small percentage of other materials. One can imagine that in a few years this line might use a million tons of granulated slag, and within 10 or 15 years, perhaps two million tons, or more.

It would thus appear that the commercial uses for blast furnace slag may consume one-half the total production. What the total can become within the next 10 years it would be venturesome to predict, but it is certain that the total may be greatly and rapidly increased if its promotion and development can be given sufficient, forceful, carefully planned attention, especially with strong support from the furnace operators, including active co-operation in maintaining a satisfactory and uniform character of slag. To dispose of large quantities of slag requires persistent and intelligent promotion and sales effort, including work requiring years to accomplish in demonstrating to the engineers of national, state,

sity and local authorities, also local sales promotion that often precedes sales by a year or two, arrangements first to have it used, and second to assure careful workmanship in carrying on construction in which slag is used, even including organizing, equipping and operating contracting companies, trucking companies, etc.

Greater Recognition Is Urged

The National Slag association and the producers of commercial slag are dealing regularly with 5 to 10 departments or bureaus of the United States government, with several departments or bureaus in each of 30 states, plus the departments, bureaus or officials of many hundreds of counties and thousands of cities, towns and townships, as well as consulting and designing engineers in private practice. They also have to deal with a hundred committees of a score of technical societies. When all these departments, bureaus, officials, committees, societies and individuals have accepted slag on an equality with competing materials and included slag on the same basis in all the hundreds of specifications, the maximum possible consumption of slag will begin to be known.

One direction in which furnace operators can help to make continually sure of avoiding complaints and objections to the use of slag is by insisting rigidly that ashes, coke dust, flue dust, sand clay, stone screenings, coal dust and any other refuse that accumulates around the furnaces shall be disposed of somewhere else than in the slag pit. Undoubtedly most of the waste materials mentioned are mineral and could cause little actual damage if mixed in with the slag, but they can cause immense damage and interference with the slag business from the point of view that the inspector will not believe that it is possible to have good results with the slag if these foreign materials are not excluded. Especially would the engineer fear that the foreign materials might have bad results in concrete.

Engineers also object to the lack of uniformity in the weight of the slag, which is due chiefly to the varying proportion of the "honeycomb" slag to the dense slag free of gas pockets. Attention to the lesser operating details, such as the routine method of pouring the slag, and no doubt other small matters that can be discovered by observation,—and that do not add real cost,—will help to obviate this difficulty, and substantially reduce market resistance to the sale and use of slag.

The newest danger, in some localities, threatening the successfully increasing use of slag in the air-cooled form, lies in the possibility of changes in furnace practice, particularly in the direction of using a calcite flux exclusively in preference to a dolomitic limestone, or to mixing a small percentage of dolomite with the larger percentage of straight calcite. The furnaces in which the straight calcite stone is used produce a slag that tends to disintegrate on exposure to the air and cooling to the extent of one-third, even one-half or more, of its total volume. Practically it is impossible to use such a slag in a commercial way and it is only fit to be wasted. In granulated form, of course, a slag of this analysis is useful and perhaps for some purposes better than granulated slag from a furnace in which the flux is dolomitic, but the commercial value of granulated slag is as yet insignificant even for the purposes for which it is actually used. The iron scrap salvage also is difficult or largely impossible when the slag is granulated. Perhaps with future development great quantities may be consumed for manufacturing purposes, including those to which allusion has been made and others not yet developed. However, at the present time the greatest value is recovered from the slag in the hard, air-cooled form and the immediate possibilities of greatly increased use lie in this direction.

Slag Must Not Be Limey

Therefore, attention of the operator is called to this, and the question submitted: Can he afford to neglect these possibilities of the use of a substantial percentage of the total slag to be disposed of by insisting on producing "limey" slag through the use of straight calcite flux? Practically, of course, it comes down to the question of whether the use of a certain percentage of dolomite or a dolomitic limestone really adds to the cost of operating the furnaces and to the corresponding cost of the pig iron. There seems to be a difference of opinion among blast furnace superintendents on this point, but some of them have changed the flux from calcite to dolomitic limestone for the especial purpose of guaranteeing usable slag for construction purposes. Some of them claim improved furnace operating results and lower cost resulting from mixing a percentage of dolomite with the calcite flux.

This article covers mainly the first 20 years of developing use of blast furnace slag. No one knows the future, but if no new process of refining is discovered, and applied, there may, by the end of another 20 years be 30,000,000 tons or more of slag to dispose of yearly. Whether the commercial disposition for economically valuable purposes shall be less than 10,000,000 tons, or over 20,000,000 tons, depends quite largely on the policy and practice adopted by the furnace operators.

Producing Heavy Forgings

(*Concluded from Page* 1236)

and its soundness verified. This should be made a regular requirement, both for the buyer's and the maker's protection. No reputable maker would wittingly send out such a defective forging, but if the buyer will not authorize boring the piece he has only the reputation of the maker as a guaranty of its soundness, unless magnetic or X-ray testing can be developed to include such sizes.

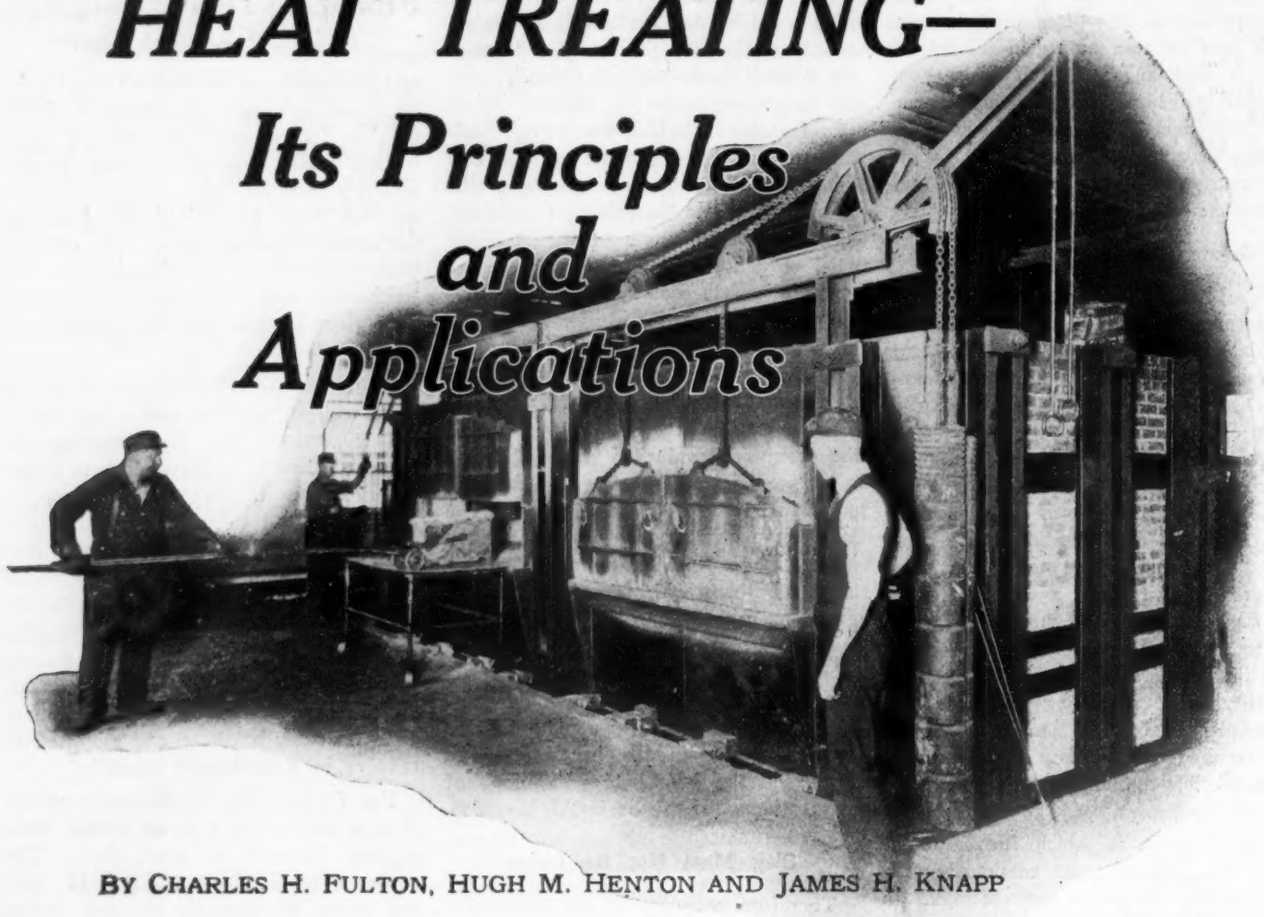
From our early childhood, most of us have been familiar with a toy called the gyroscope, but it remained for Elmer G. Sperry of New York to make practical use of its uncanny powers. He has applied them in many different and most ingenious ways, one of which is of interest to us. He has produced gyroscopes of great proportions which are used to stabilize vessels, damping their tendency to roll. The rotating body is a steel flywheel, or rotor, of uniform density, accurately machined. most delicatey balanced and mounted to revolve in a horizontal plane.

Fig. 7 shows the mechanism of which it is a part. For a large vessel, such a rotor becomes of great size. The rotor is made from a disk 12 feet 6⅝ inches in diameter by 16¾ inches thick. A series of tangential tests is cut from the faces of the disks, where a groove on the face of the finished part makes such testing possible.

Shortly before the World war began, the Midvale Steel Co. began the construction of a 20,000-ton forging press. The entablature was to consist of two main steel castings bolted together, but after the first half of the entablature had been cast, various considerations led to a decision to substitute nickel steel forgings for the carbon steel castings first planned. The decision resulted in a modification of the design which could not have been confidently elaborated without knowledge that its main components were procurable. The forging was 12 feet wide in the center, about 9 feet wide at the ends, 4 feet thick at the column bosses, decreasing to 1½ feet thick at the center, and about 28 feet over all. This forging weighed 289,000 pounds and was produced from an ingot weighing 458,000 pounds.

The press of which this forging is to form a part has not been completed. It awaits a call from engineers of the country for forgings larger than those entering into its own construction, since the treaty for the limitation of armament has for the present ended the work for which it was originally designed.

HEAT TREATING—
Its Principles and Applications



BY CHARLES H. FULTON, HUGH M. HENTON AND JAMES H. KNAPP

Chapter II—The Structure of Iron and Steel (continued)

PERHAPS the easiest way to reach an understanding of the structure of the iron-carbon series and the changes which take place on heating and cooling is to study the iron carbon diagram shown in Fig. 4. This is the iron-carbon equilibrium diagram, and shows the state or condition of any member of the iron-carbon series ranging from 0 to 6.67 per cent carbon, dependent upon the temperature.

The percentage of carbon is indicated as a horizontal dimension and the temperature as a vertical dimension. Any given steel or iron is indicated by a vertical line. For example, the line *a-g* indicates a steel of 0.4 per cent carbon and the line *t-x*, a cast iron of 3.4 per cent carbon. The dividing line between steel and cast iron is placed at from 1.75 to 2 per cent carbon, which is approximately the maximum amount that iron can retain in solid solution. Any point on the line, as for example, *b* on *a-g*, the 0.4 per cent carbon steel, indicates this steel at a certain temperature, in this instance at 1520 degrees Cent. (2768 degrees Fahr.). The point *b* is on the V-shaped curve *ABD*, which is the freezing point curve of the iron carbon series of alloys. This curve marks the freezing points, or conversely, the melting points of all the steels or cast irons. At the temperature of the point, 1520 degrees Cent. (2768 degrees Fahr.), the steel *a-g* is at its freezing point. Above it, it is in the molten condition. Above the V-shaped curve *ABD*, which comprises region 1 of the diagram, all the members of the iron carbon series are in the molten condition. In this region carbon is dissolved in the iron. The carbon, however, is not dissolved directly as such, but on the addition of carbon to molten iron, the carbon enters into chemical combination with the iron in the proportion of 3 atoms of iron to one atom of carbon, or Fe_3C, the proportion by weight being 93.33 per cent iron and 6.67 per cent carbon. This compound, which is known as *cementite*, then dissolves in the molten iron. In the solid state, iron above a temperature of 1130 degrees Cent., (2040 degrees Fahr.) can retain in the form of solid solution, up to about 30 per cent cementite, equivalent to 2 per cent carbon. By that it is meant that iron in the solid state can hold in solution, that is, can form a homogeneous constituent, a maximum of 2 per cent carbon in the form of cementite. This solid solution is known as *austenite*. As at

A Complete Text Book in Serial Form

AS OUTLINED in the issue of Oct. 4, "Heat Treating—Its Principles and Applications" is a complete treatise on heat treating, of which the accompanying article is the third of 18 installments. The second installment appeared in the issue of Oct. 18.

The work is the result of the experience of three competent authors. Charles H. Fulton is director of school of mines and metallurgy, University of Missouri; Hugh M. Henton is consulting metallurgical engineer and assistant professor of metallurgy and mining, State College of Washington, and James H. Knapp is furnace engineer, Tate-Jones & Co., Pittsburgh.

The next installment will appear in the issue of Nov. 15.

the temperature mentioned, the iron is in the *gamma* state, austenite is a solid solution of cementite in *gamma* iron, the amount of cementite present ranging from traces to 30 per cent, the last being equivalent to a carbon content of 2 per cent. Austentite, containing *gamma* iron which is normal only at the higher temperature, is, of course, not preserved in the steel when this is cooled slowly to room temperature, since during the cooling the *gamma* iron is changed first to *beta* iron and then to *alpha* iron as has been explained. But the changes to *beta* and *alpha* iron take time, and if this time is much shortened by rapid cooling, as for example, by quenching in ice water, or in mercury, or more drastically still in liquid air, the change from *gamma* iron to *alpha* iron cannot take place, or at least it takes place only partially, so that the austenite is preserved at room temperature. When elements are present in the steel which materially lower the critical or transformation points, such as considerable carbon (1.5 to 2 per cent, or nickel or manganese, austenite is quite readily preserved at room temperature. In fact, in manganese steel (12 per cent manganese) and with certain nickel alloys of high nickel content (25 per cent) even slow cooling preserves austenite. In ordinary steels, however, austenite is not preserved, even with rapid quenching from a high temperature, but a constituent which is known as *martensite,* which is described further on.

Austenite is relatively soft, from which fact we draw the conclusion that *gamma* iron is soft. It is to be noted that the extremely rapid cooling or quenching which does not afford sufficient time for the normal molecular change to take place in the iron is a form of heat treatment, which is commonly used in hardening, as will be described in detail. Fig. 5 shows a micrograph of austenite. The austenite is present in the form of polyhedral grains and the structure in general resembles that of pure iron.

In order to gain certain fundamental conceptions of structure it is desirable to follow on Fig. 4 the cooling of a cast iron of 3.4 per cent carbon, indicated by the line *t-x*. Taking this iron at the point *t* in region 1 at 1600 degrees Cent., (2912 degrees Fahr.), it will cool without change as the temperature drops, until the point *u*, 1220 degrees Cent., (2228 degrees Fahr.) is reached, on the curve *AB*, when solid saturated austenite will begin to freeze out from the liquid mass. Saturated austenite contains the maximum per cent carbon, namely 2 per cent. Since the freezing out of material containing 2 percent carbon from a molten mass that contains 3.4 per cent carbon, must make the part that stays molten richer in carbon, the composition of the molten material shifts toward the point *B* as the temperature drops toward the point *v*. The temperature of the point *v* is reached as the composition reached the point *B* (4.3 per cent carbon). At this point the still molten material freezes into a conglomerate consisting of alternately arranged little plates of austenite and cementite This conglomerate is known as the *eutectic*. The eutectic is always of the same composition and always freezes at the same temperature, in this case 1130 degrees Cent. (2066 degrees Fahr.), which is the lowest freezing point in the iron carbon series. The amount of eutectic in an alloy of the iron carbon series depends upon its composition, compared to the composition expressed by the line passing through *B*, namely, 4.3 per cent carbon. A cast iron of this composition will freeze at *B*, 1130 degrees Cent., (2066 degrees Fahr.) to all eutectic. In compositions expressed by lines to the left of *B*, the amount of eutectic diminishes until

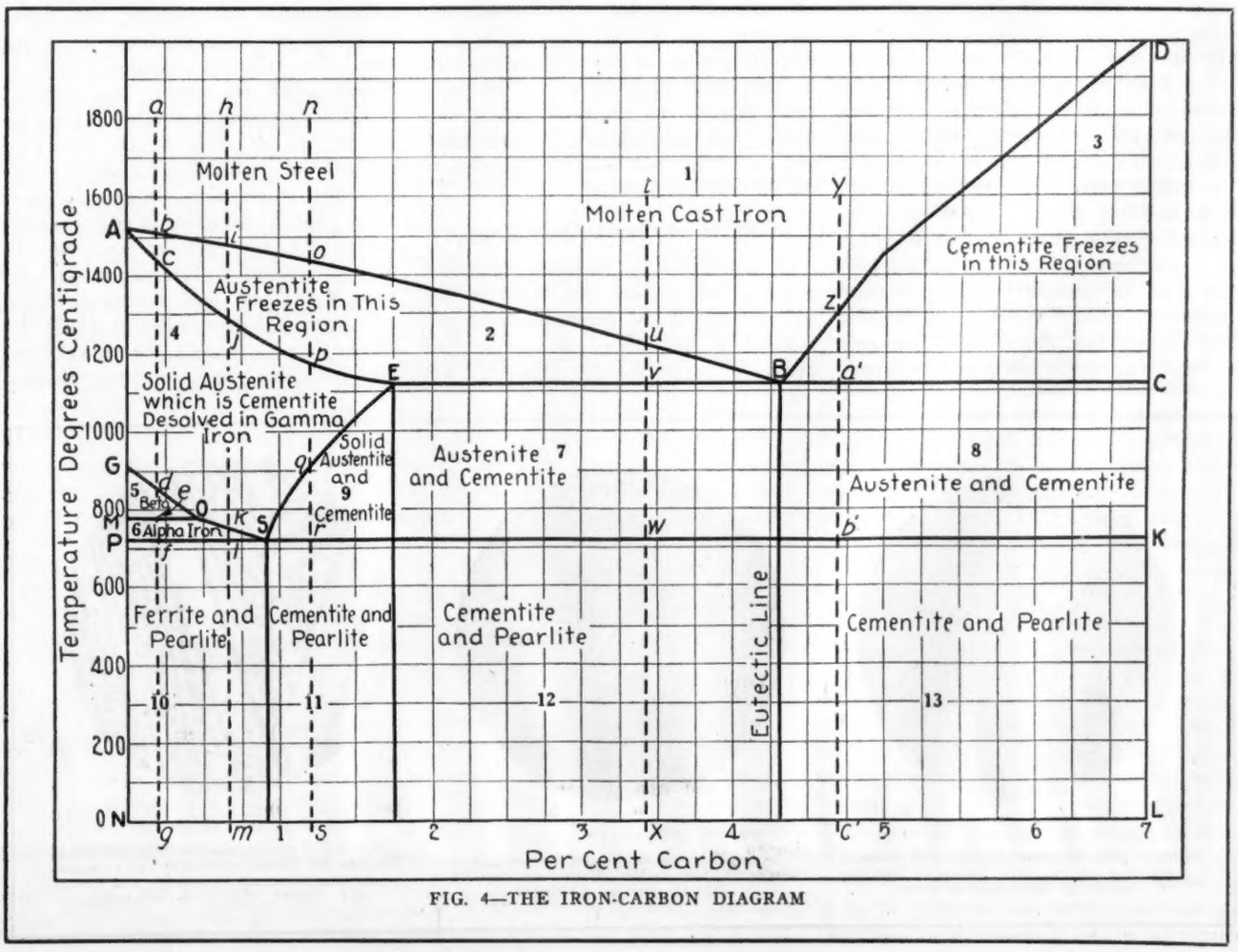


FIG. 4—THE IRON-CARBON DIAGRAM

FIG. 5—AUSTENITE, POLYHEDRAL GRAINS

Steel; carbon, 1.6 per cent; manganese, 1 per cent; quenched from 1400 degrees Cent. in ice-cold water. (Robin and Gaertner)

FIG. 6—HYPOEUTECTIC WHITE CAST IRON

Quenched immediately after solidification. Masses of austenite (dark) in a matrix of eutectic of austenite (dark) and cementite (light). (X 750) (Goerens)

FIG. 7—PEARLITE. (X 500)

Finger print structure. Interstratified plates of ferrite and cementite. The darker constituent is cementite, the lighter is ferrite. (Herman-Holz)

a line passing through E is reached, when there will be no eutectic, but only the constituent, austenite. Again in compositions expressed by lines to the right of B the amount of eutectic diminishes, until the line DL is reached, when there will be no eutectic, but only the constituent, cementite. The substance which freezes out first during cooling, toward the eutectic temperature B, is termed the excess substance, that it, it is the constituent present in quantity above that required for the formation of the eutectic. It is evident from a consideration of the diagram that in alloys containing between 2 and 4.3 per cent carbon a substance of a smaller carbon content than the eutectic composition, namely austenite, must freeze out to concentrate the cooling mass to 4.3 per cent carbon, while in alloys of more than 4.3 per cent carbon, or those to the right of the point B, a substance of a higher carbon content than the eutectic composition must freeze out, namely cementite, to concentrate the cooling mass to 4.3 per cent carbon. The excess substance may, therefore, be either austenite or cementite, dependent upon whether the alloy contains less or more than 4.3 per cent carbon. In alloys containing less than 2 per cent carbon (the steel group) no eutectic is formed, hence the eutectic is found only in the cast irons. The cast iron represented by the line t-x when it has cooled to just below the temperature v (1130 degrees Cent.) will be all solid and consists of excess substance, austenite, surrounding which is the eutectic of interstratified plates of austenite and cementite. In cooling from u to v or through region 2, the alloy was partly in the liquid and partly in the solid state, that is, the excess substance, austenite, was freezing and became solid, and the molten part was concentrating to the eutectic composition.

Effect of Rapid Quenching

If now the alloy is rapidly quenched from a temperature just below v the structure due to the excess austenite surrounded by the eutectic of interstratified plates of austenite and cementite will be preserved and appears as shown in Fig. 6.

If the alloy be not quenched, but allowed to cool slowly, further changes in structure take place. As the temperature falls from v to w the austenite present as excess substance (*prime austenite*), and the austenite in the eutectic (*eutectic austenite*) decreases in carbon content, by rejecting cementite. It is to be remembered that austenite is not of fixed composition, but is a solid solution which may contain from traces of carbon up to a maximum of 2 per cent. By rejecting cementite, high in carbon (6.67 per cent), the austenite decreases in carbon content, until the temperature of w (725 degrees Cent.) is reached when it contains 0.9 per cent carbon, and is sometimes known as *hardenite*. That is, hardenite is austenite containing 0.9 per cent carbon. If the alloy be quenched just above 725 degrees Cent., and then compared to the alloy quenched just below v (1130 degrees Cent.), it will be found that the remaining austenite has changed

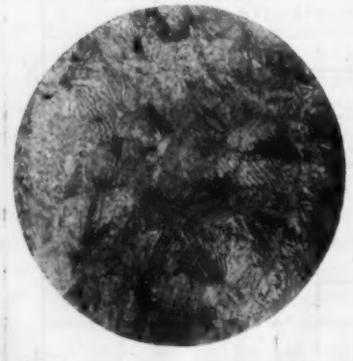


FIG. 8—PEARLITE. (X 400)

Finger print structure. Note the different orientation of the little plates or lamellae indicating the grain structure

FIG. 9—PEARLITE. (X 2000)

The lighter, noncontinuous constituent is cementite, the darker continuous constituent is ferrite. (Jeffries)

FIG. 10—HYPEREUTECTIC WHITE CAST IRON

Quenched immediately after solidification. Needles of excess cementite in a matrix of eutectic of austenite (dark) and cementite (light). (X 750) (Goerens)

somewhat in appearance under the microscope (it has become martensite) and that the amount of cemenite has increased. The cementite which formed during the cooling from *v* to *w* is known as *proeutectoid cementite* to distinguish it from the cementite of the eutectic. If the alloy be cooled through the temperature *w* (725 degrees Cent.), the remaining austenite of hardenite composition changes to a conglomerate consisting of little plates of cementite and little plates or lamellae of pure iron or *ferrite*. This conglomerate is in structure similar to the eutectic of cementite and austenite but, as it forms while the iron is solid, is known as an *eutectoid*, and is named *pearlite*. The name pearlite is derived from the fact that the conglomerate under certain conditions under the microscope has a pearly appearance. The change from 0.90 per cent austenite into pearlite occurs at a given temperature on cooling, this temperature being a critical point, known as Ar_1 (703 degrees Cent.). This critical point known generally as the A_1 or the *recalescence*. The recalescence point is a point of the iron-carbon series and not one of pure iron. As described for the critical points of pure iron it occurs at different temperatures on cooling and on heating, the temperature interval again being known as the lag or hysteresis. The equilibrium temperature, Ae_1 is usually given as 725 degrees Cent., while the converse transformation, that is pearlite to hardenite, takes place at Ac_1 at 738 degrees Cent. At the recalescence, that is, on cooling, a considerable amount of heat is given out, and dilation occurs. The amount of heat liberated at the transformation point of course is dependent on the amount of pearlite formed (steel with 0.9 per cent carbon forms all pearlite, while to either side of this composition the amount of pearlite decreases, as is evident from the diagram), and with much pearlite the heat may be liberated so fast as to cause an actual rise in temperature of the steel, to which phenomenon the term recalescence is due. In alloys of more than 0.9 per cent carbon the critical points present in iron are all merged into one with the A_1 point, as will be described in further detail later. The appearance of pearlite under the microscope is shown in Figs. 7, 8 and 9. The final composition of the cooled alloy, represented by the line *t-x*, is hence as follows: The austenite which froze out in relatively large masses or islands as excess substance, rejected cementite in cooling through region 7. On passing to region 12, the contracted islands of austenite, now containing 0.9 per cent carbon, changed to islands of pearlite consisting of minute plates of ferrite and cementite. The eutectic which froze at *v* temperature, the boundary between regions 2 and 7, and consisting of small interstratified masses of austenite and cementite, undergoes change in passing through region 7, in that its austenite masses also reject cementite just as the excess austenite masses above did, and then the remaining 0.9 per cent small austenite islands change to pearlite in crossing the boundaries between region 7 and 12. The solidified alloy consists of islands of pearlite, in two groups, one larger than the other, and cementite plates also of two distinct origins, as explained above. In turn the pearlite consists of ferrite and cementite, so that when the alloy is considered from the standpoint of constituents or entities present, the only two found are ferrite and cementite. The arrangement or grouping of these, however, is highly important as is the relative quantity of each that is present.

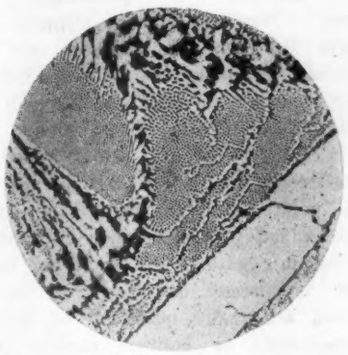


FIG. 11—WHITE CAST IRON (HYPEREUTECTIC) SLOWLY COOLED
The larger white areas are plates of excess cementite. The dotted structure is eutectic in form, but now consists of the dark spots large and small, which are pearlite, and the white parts which are cementite. (Herman Holz)

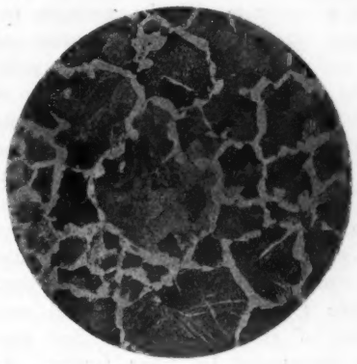


FIG. 12—STEEL (X 400) SHOWING NET STRUCTURE
Islands or mesh of pearlite surrounded by a network of ferrite. (Herman Holz)

If the alloy *t-x* be heated from room temperature past its melting point the reverse changes, from pearlite to austenite, take place on crossing from region 12 to 7, followed by the absorption of cementite through region 7, then the gradual melting of the excess austenite, through region 2, until at *u* the whole mass becomes molten.

If the freezing of an alloy to the right of the point *B* is considered, as for example a cast iron of the composition expressed by the line *y-ć*, the cooling and changes are similar to that described for *t-x*. However, on passing the point *z*, cementite separates out in place of austenite as the excess substance. At *á*, the eutectic freezes just as described for *t-x*. The only austenite present is now in the eutectic, and this austenite again rejects cementite in passing through region 7, and on passing the critical point A_1 at *b*, changes to pearlite. The only pearlite present in the alloy *y-ć* is that which originates from the austenite of the eutectic. The net difference between the alloys *t-x* and *y-ć* is that less pearlite and more cementite is present in the last one. A micrograph of this alloy, quenched at *á* is shown in Fig. 10 and a micrograph of a slowly cooled alloy is shown in Fig. 11.

In describing the structure of cast iron and its formation, the assumption has been made that the cast irons are practically free from silicon, so that no decomposition of cementite takes place during cooling, with the resultant nonformation of elemental carbon in the form of *graphite*. In cast irons relatively high in silicon, cementite partially breaks up into ferrite and graphite during cooling, but as this does not take place in the steel group, with which this book is primarily concerned, the subject is not discussed in detail.

The several constituents of the iron-carbon series, namely ferrite, or pure iron, cementite, the carbide of iron, Fe_3C, austenite the solid solution of cementite in *gamma* iron, and pearlite, the conglomerate of ferrite and cementite have been discussed and it is possible now to pass to the steel group and discuss its constitution. In the steel group which ranges from pure iron to the saturated solid solution of austenite, containing from 1.75 to 2 per cent carbon according to the several authorities, any member below the temperatures indicated by the curve *AE* will consist of white-hot austenite. No eutectic is present, such as was found in the cast irons to the right of the point *E*. In order to make plain the constitution of the carbon steels the solidification and freezing of a number of steels of different composition will be followed in detail. The line *a-g* represents a steel containing 0.2 per cent carbon. Molten at *a*, it cools to the temperature represented by the point *b* (1530 degrees

Cent.,) on the curve *AB*, freezes during the range *bc*, and becomes solid white-hot austenite of 0.2 per cent carbon composition. It then cools to the point *d*, (845 degrees Cent.), on the curve *GOS*, which represents the temperature displacement of the critical points of iron resulting from the addition of carbon. *GO* represents the displacement of the A_3 point, and *OS* the displacement of the A_3 and A_2 points, while *S* represents the critical point A_1 or the change of austenite to pearlite, or vice versa. When the temperature indicated by the point *d* is reached, *beta* iron, or as it may be called *beta* ferrite, separates out from the austenite grains, and is rejected to the boundary of the grain if the cooling is slow enough. The separation of this pure iron enriches the austenite remaining, in carbon. As the steel cools to the point *e* *beta* ferrite continues to separate out, the austenite remaining reaching a carbon content of 0.45 per cent as indicated by the point *O*. As the temperature falls below *e*, the *beta* ferrite, changes to *alpha* ferrite and then as the cooling proceeds to the point *f*, (725 degrees Cent.), additional *alpha* ferrite separates out, the remaining austenite concentrating to 0.9 per cent carbon or hardenite composition expressed by the point *S*, as the temperature *f* is reached. The steel now consists of grains of 0.9 per cent austenite surrounded by *alpha* ferrite. As the temperature *f* is passed the austenite of hardenite composition changes to pearlite in precisely the same manner as was described for the cast irons. The steel now consists of islands of pearlite surrounded by *alpha* ferrite. No further change takes place in cooling from *f* to *g*. On heating a steel of the composition represented by the line *a-g*, the reverse changes take place. As the temperature of the point *f* is passed, (and here it must be remembered what has been said about lag and hysteresis, that is, *f* represents the point Ae_1 the equilibrium point, and on heating the temperature is higher, namely Ac_1) the pearlite changes to austenite of hardenite composition, then as the temperature passes to *e*, *alpha* ferrite of the boundaries is absorbed by the austenite grain, and as *e* is passed the remaining *alpha* ferrite changes to *beta* ferrite, which in turn is absorbed by the austenite grain and finally as *d* is passed the absorption is complete and only austenite remains.

Steel of 0.65 Carbon Similar

For a steel 0.65 per cent carbon expressed by the line *h-m*, the manner of cooling and the resultant constitution is similar. The steel freezes in the range from *i* to *j*, after passing which point it is solid white-hot austenite of 0.65 per cent carbon composition. It cools to a temperature expressed by the point *k*, on the curve *GOS*, when *alpha* ferrite separates out, the austenite remaining concentrating in carbon toward 0.9 per cent, which concentration is reached at *S*, when the temperature has fallen to the point *l*. Further cooling converts the austenite of hardenite composition to pearlite, after which no change in structure takes place. The difference between the steel of 0.2 per cent carbon, represented by the line *b-g*, and the steel of 0.65 per cent carbon, represented by the line *h-m*, is that the latter contains more pearlite than the former. Conversely it contain less ferrite. A steel of 0.9 per cent carbon will contain all pearlite and no excess ferrite, while an alloy expressed by a line an exceedingly small distance from the line *AN* will be practically all ferrite and only a trace of pearlite, or practically pure iron. New pearlite contains always 0.9 per cent carbon, and this amount of carbon can form 13.48 per cent cementite, so that pearlite will contain 13.48 per cent cementite, and 86.52 per cent ferrite. It is to be noted that the steels after they cool below the critical point Ar_1 consisting as they do of excess ferrite and pearlite, this pearlite being an aggregate of ferrite and cementite as already described for the cast irons, are really made up of but two constituents or entities, namely ferrite and cementite, just as are the cast irons. In the steels the amount of cementite is less and the amount of ferrite greater. The ferrite present in the pearlite may be called the pearlitic ferrite, an that which separated out to the grain boundaries during cooling is known as the excess ferrite as already described. The two combined are known as the total ferrite. In Chapter III, exact data is given as to the amount of the different entities, and the amount of pearlite present in the steel and cast iron series.

If a steel be considered of the composition indicated by the line *n-s*, this on cooling will freeze through the temperature region *o-p*, when it will be solid ausenite of 1.2 per cent carbon composition. It will further cool to the temperature indicated by the point *q* when there will separate out excess cementite, and not ferrite as did in the steels to the left of the point *S*. The temperature at which excess cementite separates out is known as the A_{cm} point and the curve *SE* is the A_{cm} curve.

This separation of cementite lowers the carbon content of the austenite, which diminishes to 0.9 per cent or hardenite composition at the point *S* as the temperature of the point *r* is reached. On cooling below this point which is Ar_1 the austenite of 0.9 per cent carbon composition is transformed into pearlite, and the steel consists of islands of pearlite surrounded by cementite.

The structure of the steels is best described by comparing it to that of a net. The net consists of the thread or cord, arranged in such a way as to enclose polygonal spaces. These spaces or openings are the *mesh* of the net and the cord surrounding the spaces is the *network*. The network may be light or heavy as determined by the diameter of cord that is used. In steels the pearlite will be the mesh and the excess ferrite or the excess cementite will be the network. Fig. 12 shows this structure of slowly cooled or annealed steels.

(To Be Continued)

Chinese Iron Deposits Are Small

(Continued from Page 1232)

than 25 millimeters are of course rejected.

Recently an agreement has been concluded between the Hupeh government mining bureau, operating the Elephant Nose iron mines at Tayeh, and the Liu Ho Kou Mining Co., operating the Yangste blast furnace, for the supply of between 60,000 tons and 70,000 tons of ore at $3.60 (Mex.) f.o.b. lighters at Tayeh, under the following terms as to the quality of ore supplied: Iron content based on 60 per cent to 62 per cent; for every 1 per cent above 62 per cent, an increase of 10 cents; for every 1 per cent below 60 per cent, a deduction of 10 cents; refusal, if below 50 per cent. Manganese, 0.5 per cent; for every 0.1 per cent above 0.5 per cent an increase of 10 cents. Silica, up to 10 per cent; for every 1 per cent above 10 per cent, a deduction of 5 cents; refusal, if above 20 per cent. Phosphorus 0.05 per cent; for every increase of 0.01 per cent, a deduction of 10 cents; for every decrease of 0.01 per cent, a premium of 10 cents; refusal, if above 0.1 per cent. Sulphur, 0.01 per cent; for every increase of 0.1 per cent, a deduction of 5 cents; refusal, if above 0.5 per cent. Copper, 0.2 per cent; refusal, if above 0.2 per cent. The weight of the ore delivered is calculated on the dry basis, with 2½ per cent additional for shortage. The following empirical formula has been developed by the writer, and accepted in principle by the bureau of the mines for the settlement of the price paid for the ore delivered this year:

Let x = price of pig iron when the original contract was signed.
y = price of ore, agreed upon when the contract was signed.
z = price of pig iron (local market) when readjustment of price of ore is made.
w = a constant.
A = price of ore in $ Mex. delivered f.o.b. Tayeh at the time when the yearly readjustment is made.

In this case X=Tls. 70, being the local price of pig iron in 1919 when the agreement was signed: Y=$4.10 being

the price agreed upon at that time: Z= Tls. 35, being the price of pig iron at the beginning of this year: W=4 arbitrarily fixed, since the cost of ore for one ton of pig iron is about ¼ of the total cost of smelting.

$$A = Y - \frac{\left(Y - \frac{Z}{X} \times Y\right)}{W}$$

$$A = 4.10 - \frac{\left(4.10 - \frac{35}{70} \times 4.10\right)}{4}$$

= $3.588 (Mex.) say $3.60, which is the ruling price for ore finally agreed upon for this year.

Cost is a thing very fluid, and is not easy for one to hold for any length of time. It varies from time to time as it depends upon so many variables. So with the cost of iron manufacture in China, as well as elsewhere. Its usefulness lies in giving us a comparison and in the forecasting of future costs.

The following table gives at a glance the costs of iron manufacture in China, as compared with that in the United States:

Raw materials	Liu-Ho-Kou Mining Co. (Yangtze furnace) 1923 Gold $	Han-yang 1920 Gold $	Pen-hsihu 1921 Gold $	United States 1923 Gold $
Iron ore (1.61 tons)	3.94	3.33	14.83	9.50
Manganese ore (0.02 ton)	0.14	0.33		
Limestone (0.40 ton)	0.32	0.46		1.25
Coke (1.11 tons)	10.76	13.46		10.50
Scrap	....	0.18		....
Total	$15.16	$17.76	$14.83	$21.25
Labor	0.55	0.28	1.26	1.75
Supplies and stores	0.30	0.12	....	2.00
Repairs and maintenance	0.28	0.19	1.29	
Replacement of tools	0.03	0.36	....	
General expenses	2.60	0.96	3.82	
Financial expenses	2.80	3.60		
Power	....	0.62	1.28	....
Total	$21.72	$23.89	$22.48	$25.00

From the above it is apparent that at present China can produce pig iron more cheaply than the United States. On the whole, the cost of raw materials as well as the cost of labor is lower in China, while the purely manufacturing cost is lower in the United States. I am not sure whether the financial expenses are included in the total figure for the United States as given in the above table.

The number of man-hours per ton of pig iron at the Yangtze blast furnace is on an average about 17 as against between 1.72 and 6.2 in the United States, although the labor cost per ton of pig is cheaper in China.

Let us examine the assembling cost of raw materials per ton of pig.

	Yangtse blast furnace, 1923 Gold	Valley furnace (U.S.A.),1920
Coke	$3.64	$2.77
Limestone	0.18	0.42
Ore	1.04	6.47
Supplies	....	0.50
Taxes	....	0.31
Total	$4.86	$10.47

The present depression of the pig iron market in China is an after-echo of the world trade depression, although the panic in Japan two years ago has added its effect upon it. Under existing conditions China cannot consume more than 100,000 tons of modern furnace pig iron and so the excess of production has to depend upon the Japanese market, which, in fact, indirectly controls the local Chinese market. The price has grown more and more shaky every day. Since the cutting down of prices by the Han-Yeh-Ping Co. a few months ago, even the price of Ts.-33.00 fails to interest any buyer at Hankow. Buyers are adopting a "watchful waiting" policy. The same condition prevails in Shanghai, where buyers are not eager to place orders at Ts.36.00.

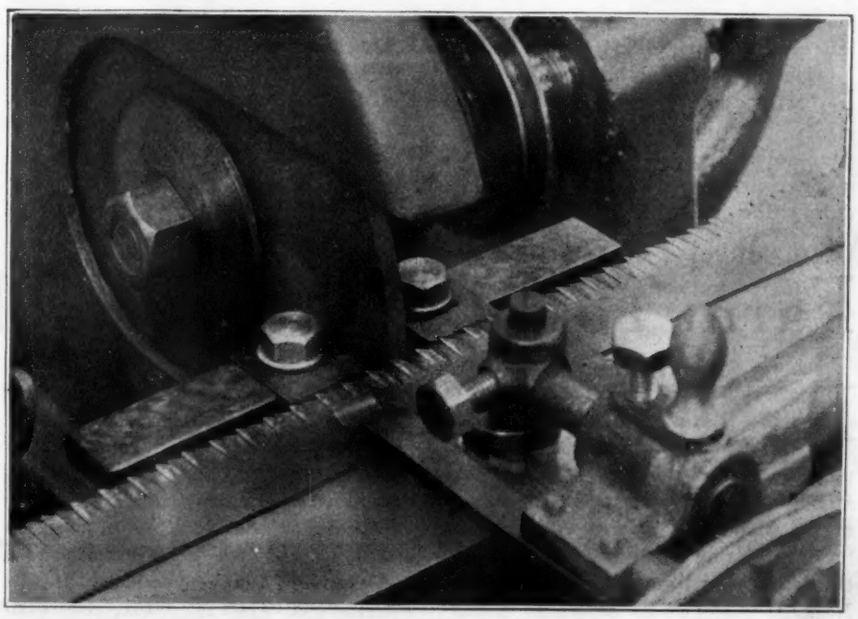
Owing to financial stringency, the Han-Yeh-Ping Co. has been shipping its stock to Japan even at a loss. At present Japanese buyers are not eager to place any order even to as low as Ts.29.00, f.o.b. Hankow. This condition of affairs is indeed gloomy. It would appear that the best way for China to get out of this apparently hopeless situation is to have more steelworks established, big enough to absorb the pig iron produced, otherwise she will be obliged to rely upon the Japanese market, where Indian pig iron is trying hard to undersell Chinese pig iron. May the man at the helm of this industry have a wide vision of this situation!

Christian W. Lynch was recently made permanent receiver for the Harrisburg Foundry & Machine Co., Harrisburg, Pa., by the Dauphin county courts. He was appointed temporary receiver about a month ago.

Introduces New Type of Hack Saw Blade

A greater output per hour from the sawing machine and a large increase in the output per blade are the features claimed through the use of a new sawing machine, hack saw blade and blade sharpening machine recently introduced by the Edward G. Herbert, Ltd., Manchester, England. One of the devices, the hack saw blade, which is shown in the accompanying illustration in the process of being ground, has a new type of set, which, it is claimed, allows an extra large number of grindings. The set extends beyond the root of the tooth, making it possible for the blade to be sharpened until the original teeth have been entirely ground away. The new formed teeth will have enough set to clear. The blades are made of high-speed tool steel and are especially suited to sawing hard metals.

The saw sharpening machine grinds the hack saw blades exactly to models having the correct shape of teeth. In this machine the grinding wheel is stationary and the blade moves toward the wheel in contact with the models. The teeth are ground on both faces. A diamond rest is supplied and arranged to true the stone to the correct angle. The sawing machine, which has been manufactured by this company for some time, has been redesigned to obtain the full benefit of the new type of saw. These machines are suitable for running at a speed of 170 revolutions per minute while putting a heavy pressure on the blade. The saw holders have an indicator which shows when the blade is being strained sufficiently, thus preventing the breaking of blades.



GRINDING IS EMPLOYED TO SHARPEN THE NEW HACKSAW BLADE

Discuss Problems of Production

Papers on Machine Tools, Management and General Topics Comprise Program of Cleveland Meeting of Society of Automotive Engineers—Role of Grinding Is Emphasized—Visit Cleveland Automobile Plants

APPROXIMATELY 200 engineers representing the leading automobile manufacturing companies in the United States, met at the Hotel Winton, Cleveland, Oct. 25-26 for the second annual production meeting of the American Society of Automotive Engineers.

The session on Thursday was devoted to a discussion of the application and use of various machine tools to the automotive industry. E. P. Blanchard, Bullard Machine Tool Co., Bridgeport, Conn., spoke on "Fundamental Principles in Modern Production Machines." Mr. Blanchard spoke first on the principle of the division of labor as announced by Babage in 1760 and of the transfer of skill as observed by Adam Smith in 1776 in his "Wealth of Nations," and then traced the application of these principles, which have been proven to be correct, to two special purpose machines of high productivity recently introduced by this company.

A. J. and C. L. Ott, American Grinder Co., Detroit, in a paper on "Spur-Gear Grinding" described a new machine recently placed on the market by this company for grinding gears on a production basis. The authors discussed some of the features of this machine and also described a device used to determine the slight deviations in the form of gears. By using a model gear and this machine and plotting charts, a check for tooth contour and spacing may be had.

Oscar A. Knight, Norton Co. Worcester, Mass., in a paper on "Developments in Production Grinding in the Automotive Industry" stated that progress which has been made in grinding during the past few years has been along the line of grinding multiple parts simultaneously, such as piston rings, ball and roller bearing cups.

Various problems pertaining to the factory manager were presented and discussed at the Thursday afternoon session, which was presided over by H. W. Alden, president of the society. In a paper on "The Human Element in Production," W. F. Jameson, Cleveland Automobile Co., Cleveland, pointed out that numerous wage incentive plans are now in operation in automobile and industrial plants.

H. P. Harrison, H. H. Franklin Mfg. Co., Syracuse, N. Y., delivered a paper on "The Application of Conveyor Equipment to a Small Production Plant." He discussed the problems which confronted this company in installing conveyors without interrupting production and with a minimum amount of rearrangement of the plant. The author described conditions determining the use of power driven and gravity conveyors, and indicated the various types required for handling raw stock, for machining operations and for various assemblies.

The last paper of the afternoon session was entitled "Wage Incentive Systems," presented by Eugene Bouton of the Chandler Motor Car Co., Cleveland. Mr. Bouton believes that the incentive is necessary to teach the worker to concentrate on the task at hand, and of all incentives, the feeling of working for himself is the most lasting.

Percy L. Brown, Corona Typewriter Co., Groton, N. Y., discussed "Production Control Methods of the Corona Typewriter Co." at the evening session on scientific management held in conjunction with the Taylor society.

At the general session on Friday morning, Ralph E. Flanders, Jones & Lamson Machine Co., Springfield, Vt., spoke on "Standard Machines for Quantity Production." He pointed out the dangers often experienced in using special machines through hasty and faulty design, improper lubrication, and lack of regidity when the machine is intended for use on a quantity production basis. He offered several methods for eliminating some of this difficulty, among the suggestions being the use of standard machines and special attachments, the use of a standard machine as a foundation for highly specialized tooling, and the use of standard attachments to standard tools to make the machine adaptable for special work.

Albert F. Shore, Shore Instrument & Mfg. Co., Jamaica, N. Y., spoke on "The Standardization of Methods of Applying the Scleroscope." He stated that standardization is important in order that the tests made by various plants on the same kind of material will give results that can be compared. He presented methods that could be used for standardization.

"Factors Governing Out-of-Roundness" was the subject discussed by A. H. Frauenthal, Chandler Motor Car Co., Cleveland. He described the types of out-of-roundness, namely regular and irregular, and showed some of the imperfections in present devices for measuring out-of-roundness and pointed out improvements that may be made.

Friday afternoon was spent in visiting plants in the Cleveland territory. Groups visited plants of the American Steel & Wire Co., the Chandler Motor Car Co., the National Malleable Castings Co. and the White Co.

Farm Tool Builders Establish Research

REALIZATION of the effect of the European situation on American business and the importance of creating a better understanding on the part of the farmer of the economic situation in this country were the outstanding features of the thirtieth annual convention of the National Association of Farm Equipment Manufacturers held last week in Cleveland. As a result of insistence on the latter idea the convention voted to establish a bureau of research and publicity in Chicago. The purpose of this bureau is to educate the public to the importance of the agricultural industry and the need for efficient machinery.

Alexander Legge, president of the International Harvester Co., presented some problems of the industry in a paper read by G. A. Ranney, secretary of the company. He suggested that because of successive years of expansion in the farming area and heavy demand for implements a condition of over production has come about, now that demand is down.

The change from wood to steel in many parts of the modern implement is the cause of much longer life

and farmers also are coming more and more to shelter and care for their machinery. These factors have lengthened the life of farm tools to double that of 20 years ago. Though prices now are higher than those of prewar days, said Mr. Legge, the cost per year or per acre is much less.

Another problem pointed out by the speaker is the investment in idle capacity. Other uses can and are being found for this capacity. This condition has come about because manufacturers supplying a widely fluctuating demand have built to meet the peak demand instead of the average. He suggested that the farmer must be shown the relation of prices of farm machinery to other things he buys. Since labor represents about 80 per cent of the cost of his tools, he can be given an idea of the reason for its increased cost if he is shown that the manufacturer's labor cost has increased as much as farm labor.

One of the most enlightening addresses of the convention was that of Magnus W. Alexander, managing director of the National Industrial Conference board, New York. He recently has traveled in Europe and has drawn conclusions first hand as to conditions there. Mr. Alexander said:

"In a world so closely connected as ours now is with communication and transporation no economic disturbance can come but all the world is affected. There is no more economic isolation, but an economic inter-relation, with action and reactions. The break in the silk market in Japan a short time ago was reflected here immediately. A strike in the coal mines of England caused closing of manufacturing plants in Italy. So we in America are feeling the effect of political and economic events in Europe. Since April figures on employment, easier to determine than those on unemployment, have declined steadily according to all observers. But wages are still rising in some fundamental industries, like building and coal mining, and a rise in prices must follow.

Sensitive Business Hesitates

"Threat of impending legislation is having its effect as the new congress generally is regarded as more radical than its predecessor. Possibility of a soldiers' bonus, reenactment of the excess profits tax and other legislation are having their effect on business which always is sensitive. It is not at all certain any of these things will go through but the mere threat makes business hesitant. Then, on top of this comes the European situation. This should cause us to watch our step and not let our optimism run away with us."

Speaking of business conditions, W. H. Stackhouse, general manager for French & Hecht, Davenport, Iowa, outlined some of the difficulties faced by business and made the following suggestion as to corrective measures that may avail: That all elements of industry refrain from seeking the advantage of any single group, but consider the welfare of all; that stability in wheat cannot be attained by an arbitrary price fixed by the government but by limiting the acreage and diversifying crops; that railroads must not be crippled by adverse legislation or rates, as their welfare is necessary to that of the country.

Finley P. Mount, president of the Advance Rumely Co., argued forcibly for a campaign of education to acquaint the farmer with essential facts and to inform the general public of the essential value of modern implements on the farm. He made his point this way:

"It is estimated our farmers are more than $1,000,000 short of normal purchases of farm machinery. The department of agriculture estimates $8,000,000,000 worth of new equipment is needed on farms the next ten years to replace implements that are losing more than the cost of new. Is it any wonder we hear complaints that cost of production prevents profit? Suppose every printing press in this city were out of repair and only 50 per cent efficient. Would the bankers tell the publishers not to buy new equipment? Would they tell them to use hand presses? Would they tell them to get out less papers? They would not, and why? Because the banker is thoroughly sold on efficient machinery in urban industries. Does it mean anything to us that the average city man does not know the difference between a corn planter and a wheat drill or between a mower and a binder? If you should drive down the street with an old Marsh harvester and an Elwood Haynes auto-buggy, which would get the most attention from the man on the street? You know the answer. Yet the improvement in harvesting machinery has meant much more in the daily life of the man on the street than has the development of the automobile."

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A. T. Jackson, Emerson-Brantingham Co., Rockford, Ill.
H. G. Newcomer, Eureka Mower Co., Utica, N. Y.
J. U. Fogle, Butcher & Gibbs Plow Co., Canton, O.
C. W. Pank, Fairbanks, Morse & Co., Chicago.

Exporters Suggest World Economic Conference

That a world economic conference should be called immediately for the discussion and consideration of world economic problems, was the gist of a resolution adopted at the conclusion of the three-day convention of the American Manufacturers' Export association, held at the Waldorf Astoria hotel, New York, Oct. 24-26, inclusive. In this resolution the belief was expressed that a remission of foreign debt payments would not be detrimental to the American export trade, provided it is proved that all concessions made are adequately offset and guarantees are provided to equal in value whatever may be conceded in meritorious cases. The association expressed itself in favor of a private owned and privately operated American merchant marine. It recommended improved harbor facilities and an improvement in patent laws here and abroad.

Paul Dupuy, French senator and owner of the *Le Petit Parisian* and other French newspapers, said that France is hoping earnestly that it soon will be possible for her to withdraw from the Ruhr. He said France does not desire to annex any part of Germany and would not applaud the disintegration of Germany.

W. W. Nichols, Allis-Chalmers Mfg. Co., was elected president of the association for the ensuing year. He succeeds Col. Myron W. Robinson, Crex Carpet Co. The new vice presidents include Julius Goslin, Joubert & Goslin Machine & Foundry Co., Birmingham, Ala., and William Pigott, Pacific Coast Steel Co., Seattle. Directors include James A. Farrell, United States Steel Corp.; C. P. Coleman, Worthington Pump & Machinery Corp.; E. M. Herr, Westinghouse Electric & Mfg. Co.; E. P. Thomas, United States Steel Products Co.; and G. Arthur Schieren, Charles A. Schieren & Co.

Gear Makers Discuss Standards

Meeting of American Gear Manufacturers Association at Lake Mohonk Shows Gratifying Extent To Which Committees Are Engaged in Constructive Work—Technical Papers and Reports Reflect Progress

LIVELY interest was manifested at the semiannual meeting of the American Gear Manufacturers association, held at Mountain House, Lake Mohonk, N. Y., Oct. 25-27. While much discussion was confined to standardization work, considerable attention was devoted to problems of shop practice and other kindred matters.

A number of committee reports reflected the important constructive work now underway. A gear nomenclature has been compiled by the association, and while only tentatively submitted was believed fairly complete. Hope was expressed that the compilation would be given widespread publicity that the committee in charge might receive aid from sources outside the industry. Of interest in this connection were four charts presented by the bevel and spiral gear committee, which gave a graphic picturization of the terms used and defined. The charts are to come up for further discussion at the next meeting.

The association has decided to publish from time to time tables in loose leaf form which can be filed in a standard looseleaf book, with a view to eventually producing an authoritative gear manual. At the suggestion of the chairman, S. L. Nicholson, the tariff committee was dismissed. It is proposed to establish a new committee of wider scope, although somewhat in the nature of a legislative committee.

The semiannual dinner was held in the evening of Oct. 26, with President George L. Markland Jr. presiding. The principal speaker was S. L. Nicholson, Westinghouse Electric & Mfg. Co., who recently returned from an eight months trip around the world. He did not touch upon Japan or China, but referred principally to Australia, New Zealand and India. He declared future possibilities of trading with India are good.

It was announced that the next annual meeting will be held at the La Fayette hotel, Buffalo, April 28-30, and that the annual convention of the National Metal Trades association will be held at the Hotel Astor, New York, April 23-24, enabling members of the two associations to attend both meetings.

Manufacturers Training Their Own Executives

TECHNICAL papers and reports presented at the various sessions covered a wide range of subjects, all of which, however, have a definite relationship to the gear-making industry.

Problems faced in training men for executive positions were discussed by John Kottcamp, Pratt institute, Brooklyn, N. Y., who declared that in general colleges have failed in the proper development of men for executive work. Graduates have too little vision of the province of the executive, and too often are not trained along the definite lines, which Mr. Kottcamp regards as essential. Industry is slowly recognizing this fact, and as a result elaborate personnel organizations are springing into being. In many cases, the larger concerns are introducing systems of training for developing their own executives.

Should Train Selected Men

He said he believed, however, that industry would profit most by selecting men from its shops, after a most careful appraisal, and then sending them to a technical school for short and intensive training. Upon completion of the course, he said, they should be taken back in their former positions, to assume greater responsibilities as they proved their worth.

Pointing to a heavy waste in industry, R. M. Hudson, of the department of commerce, Washington, urged upon manufacturers the adoption of more simplified practices whereever possible. The waste now amounts to approximately $30,000,000 annually. Illustrating his remarks by lantern slides, he gave the waste percentages in a number of the leading industries. These percentages range from 29 per cent in the metal working industry, to more than 45 in some others.

Much, he said, has been accomplished in recent years. By reducing variety, manufacturers in a number of lines have been able to reduce costs and increase sales. He pointed to the progress of the automotive industry in the standardization and interchangeability of parts; to steps being taken in the machine tool and electrical industries. The brick manufacturers have reduced their lines from 66 to 6, at a great saving to the industry, and other instances were cited. However, in view of the work still to be accomplished, he believed the surface has scarcely been scratched. He stated that the department of commerce had highly developed its division of simplified practice, and urged manufacturers to make full use of its facilities.

Touching upon the broader aspects of foreign trade, taxation, tariff, and national legislation, S. L. Nicholson, Westinghouse Electric & Mfg. Co., stated that the time was never more urgent for a complete solidarity of business and industrial interests. As time goes on congress is feeling more strongly the influence of the labor and so-called radical groups, with the resultant increasing tendency toward class legislation. He stated that while organized labor represented not more than 7 to 10 per cent of the wage earners of the country, it, nevertheless, stood solidly.

Industry, he said, should be in a position to give its voice.

Sees Market in India

Mr. Nicholson, in outlinging observations made abroad, declared India for many years to come will be an increasingly fertile field for American manufacturers. There is no tariff, he said, and the native Indian is kindly disposed toward America. He considers the outlook in Australia is much less promising. A preferential tariff, for one thing, works strongly to the disadvantage of American shippers.

In an interesting paper, E. W. Miller, the Fellows Gear Shaper Co., Spring-

field, Vt., outlined by aid of lantern slides some recent developments in gear design and pointed to certain future possibilities of the field. Mr. Miller stated that notwithstanding the usual association of the idea of motion with gear teeth, the future may soon show the value of gear teeth when little or no motion occurs between engaging teeth. He declared gear teeth may become the chief factors in liquid measuring devices, actually doing the measuring while other teeth in common fashion effect the rotation of the mechanisms; also that gear teeth may occupy an important place in the rapidly developing refrigerating industry.

Calling attention to progress in design, Mr. Miller referred to the development of a multiple tooth clutch used in one of the machines manufactured by the Hendey Machine Co., Torrington, Conn. Originally this was a 6-tooth clutch, with only six possibilities of entrance. The shock of pickup was taken upon three surfaces, as the alternating teeth were cut away to permit easy engagement. He also illustrated a coupling recently developed by Gustave Fast, Baltimore, and manufactured by the Bartlett Hayward Co., of the same city. The coupling transmits power through the engagement of external and internal gears, having an equal number of generated involute teeth. The teeth of the engaging gears, it was shown, act as so many keys for the transmission of power.

Gears Have Many Uses

A pair of rotors which constitute the only moving parts of an air turbine built by the Sullivan Machinery Co., Claremont, N. H., also was shown. The rotors carry involute teeth and are disposed as herringbone gears with a short face spur gear between them. Mr. Miller mentioned several other unique applications, including a liquid measuring device, design and built by the S. F. Bowser Co., Ft. Wayne, Ind., and a pump built by the Saco-Lowell Shops, Lowell, Mass., going into their descriptions at some length. He also showed a type of gearing recently developed which he believed of interest not only by reason of its particular tooth design, but also because, in his opinion, its application solves certain right angle drive problems most economically.

The work gear committee made recommendations, with a view to reducing in number the worm hobs now carried in stocks by the various member companies. The committee's report covered not only recommendations for new designs, but also recommendations relative to hobs already in existance. The tooth form committee also reported progress. Work will be continued through the winter.

The committee on uniform cost accounting has been increased from four to 10 members. The committee plans to issue a series of papers on cost accounting. The differential committee presented a design of a differential of revised and extended scope. It was explained that it was not intended to be a permanent standard, but simply a guide for future development.

Will Submit Standard Practice

Recommended practices on gray iron spur gears, brass and bronze for gears, herringbone gears and composition gears will soon be submitted to the sponsor societies, according to B. F. Waterman, chairman of the sectional committee on standardization. Much attention has also been given to gear nomenclature, a topic which will come up for further discussion at the next meeting of the committee in January. Advisability of limiting the carbon range to 10 points on steel for general purposes also is to be considered. Tentative standards for stub tooth gears as proposed by the French and Dutch standards committees is another subject to come up at that time.

A new table of suggested sizes of keyways, keystocks, and tolerances for industrial gearing was submitted by the keyway committee, which has been working with a similar committee of the American Society of Mechanical Engineers. The old table, presented at the annual meeting last spring had 22 sizes of keyways in a range of holes from ¼ inch to 12½ inches. The new table has 18 sizes only from ¼ to and including 13 inches, the 4½, 5½, 9 and 11-inch nominal sizes having been eliminated.

The number of keyways, dimension and range of keyways from 7/16 to and including 6-inch holes or shafts are identical with those of the final report of the subcommittee, approved by the sectional committee of shafting, and recommended as a tentative American standard. It was stated, however, that the committee of the American Society of Mechanical Engineers would not commit itself on the relative merits of square or flat keys for any size shaft, and voted for a double standard.

The gear manufacturers committee, nevertheless, believes there should be only one standard; square for small and rectangular for large sizes. In the case of rectangular keys, the aim has been to make the thickness as near two-thirds of the width as is practicable. This, it was said, was agreed upon at the meetings of the American Society of Mechanical Engineers and appears to be nearly the same as the British standard.

Recommendations of the sprocket wheel committee for standards for transmission chains and sprockets were approved, and will later be acted upon by the American standards committee. The recommendations were developed by a joint committee representing the Gear Manufacturers association and the mechanical and automotive engineering societies, and were published in the August issue of *Mechanical Engineering.*

Efforts are going forward to establish a suitable method for inspecting shaper and rotary gear cutters. The committee in charge believes that possibly the most accurate method would be by the use of a lantern in conjunction with a set of master curves established for 1 D. P., then by moving the lantern to compare other pitches. The committee, however, was not in a position to make definite recommendations.

A revision in the composition gearing standard, first adopted in 1919, was approved. The revision, which covers gears made of rawhide, simply cuts out much of the text and makes the tables more explanatory.

Wellman-Seaver-Morgan Co. Sells Turbine Business

The Wellman-Seaver-Morgan Co., Cleveland and Akron, O., has arranged with the Newport News Shipbuilding & Dry Dock Co., Newport News, Va., whereby the latter company has taken over the future hydraulic turbine business of the Wellman company. This includes patterns, drawings, data, patents, patent applications, inventions, records, etc. The Wellman company has designed and constructed some of the largest hydraulic turbine plants in this and foreign countries.

The sales offices of the Wellman-Seaver-Morgan Co., in New York, San Francisco, and Birmingham, Ala., will continue to function as previously but will represent the Newport News company in hydraulic turbine work. Present turbine contracts with the Wellman company will be carried out by that organization, but future work will be taken over by the Newport News company. Edwin S. Church is president of the Wellman-Seaver-Morgan Co. and Homer L. Ferguson is president of the Newport News Shipbuilding & Dry Dock Co.

Pledges Steel Industry To Nation's Defense

(*Concluded from Page* 1227)

ment and capacities, data on Chinese producing costs, a description of the market for Chinese iron and steel, together with comments on the problems with which the industry in that country is confronted.

Other papers submitted included "Recent Developments in Steel Forgings," by John L. Cox; "Investigation of the Influence of Temperature on Charpy Impact Value of a Group of Steels of Varying Composition," by Dr. F. C. Langenberg; "Open-Hearth Furnace Regenerators," by F. B. Quigley; "Utilization of Blast Furnace Slag for Construction Purposes," by C. L. McKenzie. Discussion of the latter paper showed that there is considerable difference of opinion as to the usefulness of blast furnace slag for certain purposes such as in concrete roads.

Lord Birkenhead Speaks

For some years past the presence of distinguished foreigners at the banquets of the institute has been of frequent occurrence. The banquet Thursday night was featured by the attendance of the Right Honorable, the Earl of Birkenhead, formerly chancellor of Great Britain, and of Mirza Hussein Khan Alai, Persian minister to the United States.

Lord Birkenhead, who will return to England shortly, said that in his travels about the United States his opinion had frequently been asked regarding the British attitude toward the repayment of the debt owed by his country to the United States. He pointed out that England did not incur the debt as a principal debtor but as a guaranteeing debtor. He declared that it has been the habit of his nation always to pay its debts.

"The only feeling we have about the matter is that your other debtors might be persuaded to take the same view," he said. "To use a bit of slang that I picked up here—after all, they got away with the money and we didn't. We guaranteed it."

"The present European situation is obscure and difficult and Europe is either being submerged or emerging from the maelstrom," continued Lord Birkenhead. He would not commit himself on the subject of American intervention in Europe, but said that if he were an American cabinet minister he would intervene only in that moment when he was certain that the condition of American agriculture and of America's export trade were such as to make nonintervention impossible.

After declaring that the British people and Europe had no grievances against America because of its refusal to ratify the pact signed at Versailles, Lord Birkenhead asserted that it was "monstrous to suppose that a nation would accept a new policy fundamentally opposed to its traditions."

Five and a half years ago, he said, he wrote privately to England from the United States that there was no chance of Americans accepting the proposal "put forward in their name."

"We in Europe are having bad luck," the former chancellor continued. "It is not your fault. We had no choice but to receive the view that the proposal put forward at Paris did not represent the opinion of the American nation. Many of us suspected that it was different but we had no choice."

"Had the statesmen at Versailles said to the American representatives that they did not represent the American people, it would have been an insult to the chief executive of the United States. But there were many views to which those at Paris had to assent," he said.

Lord Birkenhead revealed in 1918 the British were seriously considering bringing away the shattered remnants of their army from France. Had this happened England would have continued the fight by sea for 20 years, he asserted. He pointed out that the entry of the United States into the war broke the German morale and brought about a blight of despair on the German nation.

Charles M. Schwab, by acclamation again was selected to conclude the program after the banquet and responded in a characteristic fashion.

Blast Furnace Will Be Built Near Boston

Boston, Oct. 29.—Construction permits have been obtained and the site has been selected for a 500-ton furnace to supply New England with pig iron. The furnace it to be located adjacent to the by-product coke plant of the New England Fuel & Transportation Co. at Everett, Mass., about five miles north of Boston.

The plan for building a blast furnace near Boston was formulated in 1909, but the war and other considerations delayed the project. Now the organization has been completed and the Mystic Iron Works has been incorporated under the laws of Massachusetts, with William E. McKay as president and Edward Page as vice president. The project still is in the early stage of development. The company has not as yet defined its construction plans, but in a general way the purpose is to build a modern furnace where it can receive tidewater shipments of ore, lime, and other material, and where it can obtain its supply of coke from the plant of the New England Coal & Coke Co. Large lime deposits exist along the coast of Maine, notably at Rockland. It is pointed out that vessels returning to Boston from foreign ore producing countries are in need of ballast and consequently offer exceptionally low freight rates on ore.

Reforming Hydraulic Steel Under Receivership

Plans are being worked out for the financial reorganization of the Hydraulic Steel Co., Cleveland, following appointment of a receiver for the company by Federal Judge Westenhaver, Cleveland. The receivership resulted from a friendly suit brought by one of the company's creditors, the Savage Arms Corp. The receiver is Thomas P. Goodbody, vice president and controller of the company. Operations of the company will be continued without interruption.

Societies News

The next meeting of the American Electrochemical society will be held in Philadelphia April 24-26, according to recent announcement. The headquarters of the convention will be at the Bellevue-Stratford hotel. Several important questions will be discussed at the technical sessions. S. Skowronski, research chemist, Raritan Copper Works, Perth Amboy, N. J., will act as chairman of the first technical session at which time "Recent Progress in Electrodeposition" will be discussed. "Organic Electrochemistry" will be the topic of the second technical session, at which C. J. Thatcher, chemical engineer, New York, will preside.

Convention Calendar

Nov. 19-22—Electric Power club. Fall meeting at French Lick Springs hotel, French Lick, Ind. S. N. Clarkson, Rockefeller building, Cleveland, is secretary.

Dec. 3-6—American Society of Mechanical Engineers. Annual meeting, New York. Calvin W. Rice, 29 West Thirty-ninth street, New York, is secretary.

Dec. 3-8—Power and Mechanical Engineering— National Exposition, Grand Central palace, New York. Fred W. Payne and Charles F. Roth, Grand Central palace, New York, are in charge.

Dec. 5-6—National Rivers and Harbors congress, New Willard hotel, Washington. S. A. Thompson, 824 Colorado building, is secretary.

Dec. 5-8—American Institute of Chemical Engineers. Winter meeting, Washington. J. C. Olsen, Polytechnic institute, Brooklyn, N. Y., is secretary.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

CONTRACT has been awarded by the Coosa Pipe & Foundry Co., Gadsden, Ala., for the construction of a plant to replace the present structure according to officials of the company. The new plant will represent an investment of approximately $75,000, and will be considerably larger than the present plant, enabling the company to increase its producing capacity from 20 to 25 per cent. It will also be furnished with new equipment, and will include a steel cupola room. Operations probably will start early in the coming year.

* * *

THE Pacific Pipe & Supply Co., Los Angeles, formerly representative of the National Cast Iron Pipe Co. in that district, has been appointed California and Hawaiian representative for the Pont-a-Mousson, France, manufacturer of cast iron pipe. This pipe is made in the Ruhr district.

* * *

ALL patents patterns, jigs, etc., of the patent cutter and reamer grinder manufactured by the Oakley Machine Tool Co., Cincinnati, have been purchased by the Landis Tool Co., Waynesboro, Pa., manufacturer of cylindrical grinding machines. The machine will be manufactured solely by the Landis company now and will correspond with sizes of Nos. 1, 2 and 3 of the Oakley machines.

* * *

ELECTRIC STEEL CASTINGS Co., has been organized recently as a sales division of the Electric Steel Products Co., Turner Falls, Mass. The plant of the latter company has been enlarged through increased capitalization and new equipment purchased consists of a No. 2 mixer, standard radial sand blast barrel, annealing ovens, etc. The Electric Steel Products Co. will specialize on basic electric steel castings of weights up to 200 pounds.

* * *

BELLINGHAM Steel & Forge Co., Bellingham, Wash., recently incorporated for $30,000, includes three local companies, the Erickson Forge Works, Standard Welding Co. and Nolte Machinery Co. B. E. Shellebarger is president, D. T. Erickson vice president and T. Shellebarger secretary and treasurer. The new company is equipped with complete fabricating plant and will handle structural and bridge steel, boilers and tanks, forging and welding work, machine work and general repairs.

* * *

THE Pioneer High Speed Machine Knife & Tool Co., Cleveland, has been organized by A. W. Erickson to produce cutting tools. Mr. Erickson until recently was superintendent of the Wapakoneta Machine Co., Wapakoneta, O., which position he held for the past seven years. He has been engaged in the manufacture of knives and shear blades for the past 31 years. The heads of the tempering and grinding divisions of the new company have been associated with Mr. Erickson for many years.

* * *

B. F. PERKINS & SON, INC., Holyoke, Mass., builder of machinery specialties, plans to increase by 50 per cent production at its Willimansett, Mass., plant, which will necessitate the expenditure of $100,000. It has let the contract for a brick and steel, reinforced concrete, 1-story and basement, 20 x 156-foot addition in which will be installed eight new hydraulic presses. Various supplementary machines and other equipment also will be installed. The building will cost $50,000 and machinery and equipment about an equal amount.

* * *

EARL SPENCER, at one time assistant general superintendent of the Pierce-Arrow Motor Car Co. plant in Buffalo, N. Y., and who has just returned from Tokio, following the catastrophe, where he was manufacturing a small kerosene burning automobile, has joined the organization of Geo. B. Morris, to be known now as Spencer & Morris, with offices at 316 Azusa street, Los Angeles. Spencer & Morris represent, in this district, the Shepard Electric Crane & Hoist Co. and the Cleveland Electric Tramrail. In addition, the company will represent the Revolvator Co., Jersey City, N. J., and will specialize in all engineering work in connection with conveying systems. Geo. B. Morris will leave shortly for an extended trip throughout the east for the purpose of making inspections and arranging with other eastern concerns for representation on the Pacific coast. The plant of the Spencer Car Co., Tokio, was badly damaged in the recent earthquake and fire.

* * *

WEIR Stove Co., Taunton, Mass., manufacturer of heating ranges and furnaces has begun construction of a 160 x 140-foot foundry. A modern 4-story, 77 x 78-foot structure has been added recently to the plant to be used for building gas ranges. Another recently added building is a 4-story structure 77 x 114 feet, to be used as a tin shop and for production of coal ranges and furnaces.

* * *

EDMOND MICHEL was elected president and member of the board of directors of the Bienville Mfg. Co., New Orleans, manufacturer of portable electric saws, at its annual meeting recently. Frank M. Carriere, southern representative of A. E. Staley Co., Decatur, Ill., was elected vice president and director; Joseph Caballero, general manager of Caballero, Dubis & Miller Co., New Orleans, was chosen secretary and treasurer and director and Joseph W. Sullivan, capitalist of Chicago, and A. Harrison Jr., New Orleans, were elected directors.

* * *

TOM REID, vice president of the Joliette Steel Products, Ltd., Joliette, Que., stated his company will start building at once the portions of the plant recently damaged by fire, and that the company purchased land adjacent to its plant on which an addition to the present structure will be erected. The pattern shop, cleaning shop, welding department, sand blast and converter plant were damaged and also the building and equipment of the main foundry. Electrical furnace equipment, transformers, compressor room and machine shop were saved. H. W. Wardell, consulting engineer, Montreal, Que., is in charge of construction and all plans for building and equipment will pass through his hands.

Men of Industry

Personal News of a Business Character Pertaining to the Iron and Steel and Related Fields

CLINTON S. BRADLEY, for the past 16 years Buffalo district manager of sales for Jones & Laughlin Steel Corp., has been named manager of the hot-rolled sales department of the same company with headquarters at Pittsburgh, as announced in the Oct. 25 issue of IRON TRADE REVIEW. Mr. Bradley succeeds Robert Geddis who for 23 years has been manager of the hot-rolled sales department, as well as a director of the company. Mr. Geddis has been given the title of manager of sales of the western district. His headquarters will be at Pittsburgh but he will devote his time principally to the upbuilding of business on the Pacific coast.

Mr. Bradley was born in Omaha, Nebr., and received his early schooling in Akron, O., before he started as an office boy with the Akron Iron Co. He left Akron to go to Boston in a branch office of the company, remaining there until 1895 when he was transferred to Chicago as Chicago representative of the Akron Iron Co. In 1897 he left to go with Whitman & Barnes Mfg. Co., manufacturer of machinists' supplies, as special New England representative. Two years later Mr. Bradley returned to Chicago as vice president in charge of sales of the Sterion Copper Co., brass founder. He left this company to become connected with the New York office of Jones & Laughlin, 21 years ago. In 1907 he came to Buffalo as district manager of sales. Mr. Bradley assumes his new duties Nov. 5. He was active in club life in Buffalo and prominently identified with the work of the federation of churches. The steel table of the Ellicott club tendered him a dinner Tuesday night at the Buffalo Athletic club.

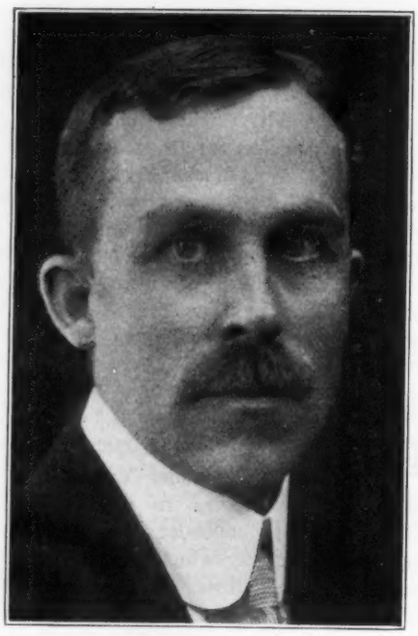
James R. Miller, Pittsburgh, has been elected director of the Superior Steel Co., succeeding H. F. Hansell.

A. W. Gray, formerly works manager of the Billings & Spencer Co., Hartford, Conn., has joined the Bristol Brass Corp., Bristol, Conn.

W. J. Doherty is in charge of branch office at 30 Church street, New York, opened by David J. Joseph Co., Cincinnati.

H. B. Gillis, superintendent of the British Empire Steel Corp., Sydney, N. S. is in Newfoundland conferring with the government.

H. V. Ruth for some years connected with C. A. Turner Co. in Pittsburgh and prior to that with Jones & Laughlin Steel Corp., has joined the organization



CLINTON S. BRADLEY

of Ducommun Corp., Los Angeles and San Francisco, iron, steel and metal distributors as special sales representative of its steel department. Mr. Ruth will make his headquarters in Los Angeles.

Clifford S. Anderson, assistant secretary and counsel for the Norton Co., Worcester, Mass., has been elected president of the Associated Industries of Massachusetts, Inc.

H. M. Dudley, western sales manager for the McWane Cast Iron Pipe Co., Birmingham, Ala., has been placed in charge of the office recently opened by that company in the Central building, Los Angeles.

Charles P. Tolman has opened an office at 111 Broadway, New York, where he will specialize in dust and fume control, handling materials and products, and conduct a general consulting engineering business. He was for the past 16 years chief engineer and chairman of the manufacturing committee of the National Lead Co.

Clayton S. Flint has retired from the partnership known as the F. A. Albertus Co., 2640 Fond du Lac avenue, Milwaukee, operator of a large welding shop. The business is being continued by Floyd A. Albertus as sole owner.

W. E. Hedgecock recently was promoted from purchasing agent to assistant vice president of the American Car & Foundry Co., in charge of sales. William J. Harris, formerly assistant purchasing agent has been made purchasing agent and John Nimock has been appointed assistant purchasing agent.

W. W. Phillips for the past 12 years representative of the Colonial Steel Co., in Rochester, N. Y., was recently placed in charge of the New York office, 149 Warwick street, as sales manager. He will succeed H. C. Poole, recently promoted to general works manager.

Howard R. Williams, associated with E. S. Rooney, district sales agent at Cincinnati of the Youngstown Sheet & Tube Co., Youngstown, was for several years assistant to the general sales manager of the Electric Alloy Steel Co., Youngstown, and later assistant district sales manager of the Atlas Steel Corp., in its Pittsburgh district.

J. F. Newman, for 12 years purchasing agent of the Weirton Steel Co., Weirton, W. Va., has become president of the Lawrenceville Bronze Co., Pittsburgh, to succeed the late John F. Robertson. The Lawrenceville company manufactures copper and bronze castings, specializing in blast furnace tuyeres, coolers, bosh plates, valve seats and rolling mill bearings.

John Wheeldon, general manager of the Wickwire Spencer Steel Corp., Worcester, Mass., has been given leave of absence until Jan. 1 and he has left on a fishing and hunting trip. Charles K. Hardy Jr., sales manager, will assume Mr. Wheeldon's duties during his absence, assisted by Winthrop G. Hall, assistant to the general manager.

Obituaries

CHARLES PROTEUS STEINMETZ, world famous electrical engineer and inventor, died Oct. 26 at his home in Schenectady, N. Y., following a short illness. Mr. Steinmetz was born in Germany in 1865 and was educated at universities in that country and Switzerland, specializing in mathematics, electrical engineering and chemistry. He also was deeply interested in politics and economics and became an active socialist at a time when the German government was taking drastic steps to stamp out socialism. This led to a conflict with the authorities which prevented him from taking a university degree. In 1889 he came to the United States and had difficulty in obtaining employment. He finally obtained a job at $2 a day in a drafting room at Yonkers, N. Y. In four years the business with which he was associated was bought by the General Electric Co. Mr. Steinmetz first was established at the Lynn plant. In 1893 he was transferred to Schenectady where he had been located since. He was chief consulting engineer for the General Electric Co. and probably was the outstanding example in America of close relationship between modern science and modern industry. Mr. Steinmetz was active in many branches of electrical science and was the author of numerous books in that field. He was a member and past president of the American Institute of Electrical Engineers. He was a member or an honorary member of numerous other societies, including the American Society of Mechanical Engineers and the Electro Chemical society.

F. F. Amsdem, general manager of the Lochiel Furnace, of E. E. Marshall, Harrisburg, Pa., died Sunday, Oct. 28.

James J. Hay, superintendent of the Vermont Farm Machine Corp., Bellows Falls, Vt., died recently at his home in that town.

Horace G. Reynolds, president of the Reynolds Wire Co., Dixon, Ill., and a pioneer wire cloth manufacturer, died at his home in Dixon recently, at the age of 70 years.

William C. Hicks, southern representative of the Globe Automatic Sprinkler Co., Philadelphia, as district sales manager with headquarters at for the previous 20 years with the Charlotte, N. C., died recently at 42 years of age in Raleigh, N. C., following a stroke of apoplexy.

W. Chapman Brown, superintendent for the past seven years of the wire weaving department of the Cheney Bigelow Wire Works, Springfield, Mass., died at his home in that city, Oct. 26, aged 55 years.

C. C. Jenks, president of the American Radiator Co., Detroit, died aboard a train at Richmond, Va., Oct. 23, at the age of 69 years. He was also president of the Jenks & Muir Mfg. Co., Detroit, manufacturer of automobile accessories. He was interested also in several Detroit industrial enterprises, being a director of the Detroit Edison Co.

William P. Clark, president of Clark Tool Works, Inc., Belmont, N. Y., manufacturer of metal cutting band saws, died Oct. 22 at his home in that city. He was organizer of the Clark Tool company in 1917 and was also president of the Insular Lumber Co. In 1877 he went to Belmont to take charge of the D. Rawson works which was later reorganized as A. W. Miner & Co., with Mr. Clark as manager. The company manufactured agricultural implements.

Clarence Renshaw, aged 49, electrical engineer of Pittsburgh and vice chairman of the Democratic state committee, died Oct. 22 at his home in that city. For the last three years Mr. Renshaw had been associated with the National Metal Moulding Co., and Westinghouse Electric & Mfg Co. During the war he was a member of the fuel conservation commission at Washington. He was born in Baltimore, and was a graduate of the Baltimore city college, but received his engineering degree at the Massachusetts Institute of Technology in 1899.

George Evans Tener, aged 67, who died Oct. 20 in his home at Sewickley, Pa., near Pittsburgh, had been identified with Pittsburgh's industries for 52 years. He was born in County Tyrone, Ireland, and came to Pittsburgh in 1871 where he became identified with the iron and steel industry. Later he was interested in the development of ore transportation on the Great Lakes and was also extensively interested in the copper industry in Arizona. He was vice president and director of the United Verde Extension Mining Co. and a director of the Calumet & Arizona Copper Co. In 1918 he retired from active participation in business.

John P. Armstrong, 381 Williams St., Atlanta, one of the pioneers in the iron and metal trades industries of the South, with which he has been affiliated for the past 40 years as president of R. S. Armstrong & Bro., Atlanta, died the latter part of October at his Atlanta home, at the age of 66 years.

In 1884 Mr. Armstrong came to Atlanta with his brother, R. S. Armstrong, and together they established the firm of R. S. Armstrong & Bro., which operates a large plant at 676 Marietta street, distributor in the southeastern territory of machinery, principally used equipment, and one of the largest scrap iron dealers in the territory. John P. Armstrong became president of the concern at the time of its organization, and remained as its active head until his recent death.

He was a member of the Atlanta Masonic lodge and was widely known in iron and steel circles throughout the South.

James W. Andrews, superintendent of the rolling mill department of the Harrisburg Pipe & Pipe Bending Co., Harrisburg, Pa., died Oct. 18 at his home in that city following an illness of six months. Mr. Andrews for many years has been a well known figure in the eastern rolling mill industry. He came to this country in 1879 from Ireland where he was born in 1851. His first connection with the iron and steel industry was in the New York office of the Coatesville Iron Co. He soon moved to Coatesville where later he operated the Laurel Iron Works under the firm of Andrews & Genner and in 1889 he went to Harrisburg to operate the Harrisburg boiler plant at Lochiel. In 1898 he went to Canada as superintendent for Peck, Benny & Co., and two years later returned to become superintendent of the Susquehanna Iron & Steel Co., Columbia, Pa. Mr. Andrews in 1903 joined the Harrisburg Pipe & Pipe Bending Co., with which company he continued up to his death. One of his sons is Fred D. Andrews, general superintendent of the Harrisburg Pipe & Pipe Bending Co.

The Reliable Machine Co., 1324 Tenth street, Rockford, Ill., manufacturer of metal goods, machinery and hardware, has increased its capital from $15,000 to $35,000.

Steel Exports Gain, Imports Drop

September Shipments of 175,429 Tons Increase 5170 Tons Over August—Iron and Steel Received Aggregating 36,562 Tons Is Smallest Monthly Total Since May 1922—Pig Iron Imports Continue To Decline

IMPORTS of iron and steel products into the United States in September, totaling 36,562 tons, registered a drop of 9050 tons from the August total, and was the smallest monthly aggregate received in any month since May 1922, when imports amounted to 23,098 tons. Exports in September were 175,429 tons, as compared to 163,010 tons in August and 128,370 tons in September 1922.

Exports for the nine months ended Sept. 30, 1923, totaled 1,505,616 tons. as compared to 1,583,083 tons for the like period of 1922 and 1,922,716 tons for the entire year of 1922. Imports for the nine months of 1923 totaling 650,914 tons is more than double the 300,542-ton total during the corresponding period of 1922, and is almost as large as the amount for the entire year of 1922 which was 733,352 tons.

Among the iron and steel products shipped in larger amount during September than August are the following materials: Semifinished; wire rods; galvanized sheets; boiler plates; black sheets steel; hoops, bands and scroll; tin and terne plate; fabricated structural shapes; rails over 50 pounds; rail joints; switches, frogs, etc.; railroad nuts, bolts, etc.; welded black pipe; malleable iron pipe fittings; cast iron pipe; cast iron pipe fittings; plain and galvanized wire; woven wire fencing; wire cloth and screening; wire rope; insulated wire and cable; cut nails; horseshoes; ferromanganese and spiegeleisen, and other iron and steel.

A general increase in most materials was noticeable, more than offsetting the decline in such commodities as pig iron, scrap, plates, black iron sheets, cold rolled strips, plain structural shapes, metal lath, miscellaneous structural forms, light rails, railroad spikes, barbed wire, wire nails, horseshoe nails, bolts, nuts, rivets and ferrosilicon.

One of the largest increases over August shipments was evidenced in rails over 50 pounds, August shipments being 19,477 tons and September exports amounting to 31,072 tons. Wire rod shipments is August totaled 1548 tons and in September amounted to 4245 tons. Black sheets steel exports increased from 5781 tons in August to 8228 tons in September, while tin and terne plate in the same periods increased from 5995 tons to 9094 tons. Fabricated shapes mounted from 2282 tons in August to 5300 tons in September, while plain structural shapes fell from 14,165 tons to 9984 tons. Plain wire increased from 2601 tons to 4386 tons and galvanized wire from 2089 tons to 3592 tons.

Iron ore imports were at about the same level in September as in the month preceding, 261,609 tons being received in the former month and 267,677 tons in August. September 1923 imports were considerably higher than those of the corresponding month of 1922, 138,838 tons being received in that month last year. Shipments to this country of iron ore from Sweden increased from 52,523 tons in August to 75,542 tons in September. Total imports of iron ore for the nine

IMPORTS AND EXPORTS
Gross Tons

	1923		1922	
	Imports	Exports	Imports	Exports
Jan.	119,955	135,046	13,404	165,962
Feb.	67,682	136,853	11,535	133,333
March	106,050	168,176	12,774	206,474
April	77,794	183,905	18,720	197,562
May	75,840	195,535	23,098	229,616
June	67,968	176,403	39,154	216,298
July	53,451	170,259	56,425	161,204
Aug.	45,612	163,010	49,054	144,264
Sept.	36,562	175,429	76,378	128,370
Oct.	.....	.....	184,202	131,542
Nov.	.....	.....	152,250	124,004
Dec.	.....	.....	96,358	154,087
Total	650,914	1,505,616	733,352	1,992,716

Year	Imports	Exports
1921	135,825	2,150,276
1920	421,274	4,934,087
1919	322,264	4,397,295
1918	169,110	5,338,019
1917	330,201	6,465,053
1916	328,965	6,110,732
1915	282,396	3,532,564
1914	289,775	1,549,554
1913	317,260	2,745,635

IRON AND STEEL EXPORTS
Gross Tons

	—September—		Nine months ended September	
	1923	1922	1923	1922
Pig iron	2,148	5,203	23,076	22,767
Scrap	9,681	2,453	49,214	55,915
Semifinished	8,366	6,357	87,968	83,840
Iron bars	630		11,313	
Steel bars	11,717	10,847	122,841	145,501
Alloy steel bars	276	379	1,941	4,409
Wire rods	4,245	1,401	23,927	36,516
Boiler plate	1,775	218	7,486	11,406
Other plates	6,975	5,077	85,117	65,577
Galvanized sheets	7,660	5,697	91,552	88,700
Black sheets, iron	1,136	931	11,353	9,521
Black sheets, steel	8,228	9,231	77,415	197,892
Cold rolled Strips	751	756	9,526	399
Hoops, bands and scroll	2,598	1,746	21,143	20,960
Tin and terne plate	9,094	6,356	80,426	59,904
Structural shapes, plain	9,984	5,436	101,010	42,241
Structural shapes, fabricated	5,300	593	25,425	15,396
Ship and tank plates, punched and shaped	188	331	2,377	1,920
Other structural forms	4,302	7,267	31,968	58,232
Metal lath	102	**	898	**
Rails over 50 pounds	31,072	15,963	178,475	199,631
Rails under 50 pounds	1,700	2,488	19,347	20,828
Rail joints, etc.	2,176	1,415	17,176	15,164
Switches, frogs, etc.	716	453	3,909	4,321
Railr'd spikes	658	710	6,861	5,881
Railr'd bolts, nuts, etc.	410	145	2,069	1,629
Boiler tubes	1,845	1,174	12,917	8,876
Casing and oil line pipe	4,244	4,834	43,010	36,624
Welded black pipe	6,482	6,147	59,298	57,809
Welded galvanized pipe	2,671	3,023	21,930	24,103
Malleable iron pipe fittings	946	562	6,527	6,075
Cast iron pipe	1,649	1,354	11,427	13,180
Cast iron pipe fittings	1,336	864	9,455	6,338
Plain wire	4,386	1,988	29,129	27,494
Galvanized wire	3,592	2,756	41,054	64,096
Barbed wire	2,903	6,880	54,856	54,327
Woven wire fencing	408	402	3,343	2,185
Wire cloth and screening	415	203	1,581	1,146
Wire rope	554	459	5,057	3,448
Insulated wire and cable	133	54	1,524	670
Other wire	921	1,022	11,064	12,339
Cut nails	118	246	1,888	3,021
Wire nails	3,063	2,320	29,179	46,835
Horseshoe nails	80	80	909	546
Other nails	435	332	3,952	3,076
Bolts, nuts, rivets, etc.	1,567	1,414	14,234	13,414
Horseshoes	106	132	699	732
Other iron and steel	5,640	5,653	51,779	40,895
Ferromanganese and spiegeleisen	45	70	3,265	1,054
Ferrosilicon	2	89	659	366
Total	175,429	133,511	1,512,347	1,600,799

*Includes ingots, blooms, billets, slabs and skelp, sheet and tin plate bars.
**Due to reclassification, comparisons are not possible.

CASTINGS AND FORGINGS EXPORTS
Gross Tons

	September		Nine months ended September	
	1923	1922	1923	1922
Iron castings	853	664	7,654	7,540
Steel castings	576	172	3,880	1,545
Car wheels and axles	2,111	1,127	15,415	12,631
Iron and steel forgings	336	93	2,455	1,894
Total	3,876	2,056	29,402	23,610

FERROALLOY EXPORTS
Gross Tons

	September		Nine months ended September	
	1923	1922	1923	1922
Ferrosilicon	2	89	659	366
Ferromanganese and spiegeleisen	45	70	3,625	1,054
Tungsten, manganese and other ores	9	..	704	....
Ferrotungsten, tungsten metal and wire	..	..	1	....
Ferrovanadium	1	..	11	20
Other ferroalloys	6	2	98	511

months of 1923 was 2,297,144 tons as compared to 684,387 tons for the like period of 1922.

Imports of pig iron in September amounting to 8353 tons, decreased from the August figure of 14,564 tons and was considerably below the shipments received in September 1922 when 46,839 tons was imported. Shipments received during the first nine months of this year totaled 336,817 tons or more than three times the total for the like period of 1922 when 109,171 tons was imported. Of the 8353-ton total of pig iron received in this country during September, 6200 tons came from England, with Belgium contributing 395 tons, British-India 786 tons, Quebec-Ontario 822 tons and China 150 tons.

PIG IRON IMPORTS
Gross Tons

From:	Sept. 1923
Belgium	395
England	6,200
Quebec-Ontario	822
British India	786
China	150
Total	8,353

IRON ORE IMPORTS
Gross Tons

From:	September 1923	September 1922	Nine months ended September 1923	Nine months ended September 1922
Spain	7,100	11,739	191,100	39,936
Sweden	75,542	33,856	674,624	219,808
Canada	580	346	23,959	1,754
Cuba	75,175	33,000	602,176	232,489
Other countries	103,212	59,897	805,285	190,400
Totals	261,609	138,838	2,297,144	684,387

Imports of various ores and ferroalloys in September totaled 45,010 tons as compared to 61,434 tons in the same month last year and 25,142 tons in August 1923. Imports of the various ores and ferroalloys for the nine months ended Sept. 30, 1923 amounted to 250,231 tons as compared to 412,595 tons for the like period of 1922.

Manganese ore imports in September totaling 35,175 tons was over twice the 16,984-ton total received in the preceding month. Of the September total 18,593 tons came from Turkey-in-Europe, 8640 tons from Brazil, 4570 tons from British India and smaller tonnages from Turkey-in-Asia, England and Chile.

IRON AND STEEL IMPORTS
Gross Tons

	September 1923	September 1922	Nine months ended September 1923	Nine months ended September 1922
Pig iron	8,353	46,839	336,817	109,171
Ferromanganese	8,756	10,718	73,650	72,011
Ferrosilicon	989	3,615	9, .	plates
Scrap	10,608	12,250	150,443	60,115
Bar iron	512	371	6,776	4,280
Steel ingots, bars etc.	2,325	1,280	14,951	16,216
Structural shapes.	405	289	7,867	1,888
Rails	2,423	705	22,522	21,866
Boiler and other plates	262	.....	1,574	.....
Sheets and saw plates	276	.....	1,968	.....
Tin plate	60	75	1,209	2,261
Wire rods	828	234	3,023	1,303
Total	35,797	76,378	630,700	301,885

OTHER IMPORTS
Gross Tons

Tubular products	261	**	3,288	**
Round iron and steel wire	252	**	3,007	**
Castings and forgings	148	**	2,178	**
Nails and screws.	41	**	924	**
Bolts, nuts, rivets, etc.	5	**	155	**
Flat wire and strip steel	58	**	862	**
Grand total...	36,562	76,378	641,114	301,885

**Due to changes in classifications, comparisons are not possible.

Imports of rails in September amounting to 2423 tons was 2026 tons less than the 4449 tons imported in August and much higher than the 705 tons received in September 1922. Scrap imports in September of 10,608 tons were higher than the 9900 tons imported in August and lower than the 12,252 tons of September last year. For the nine months ended September 1923, 150,443 tons of scrap was imported as compared to 60,115 tons for the like period of last year.

Ferrosilicon imports increased from 489 tons in August to 989 tons in September.

Malleable Manufacturers Decide on Name

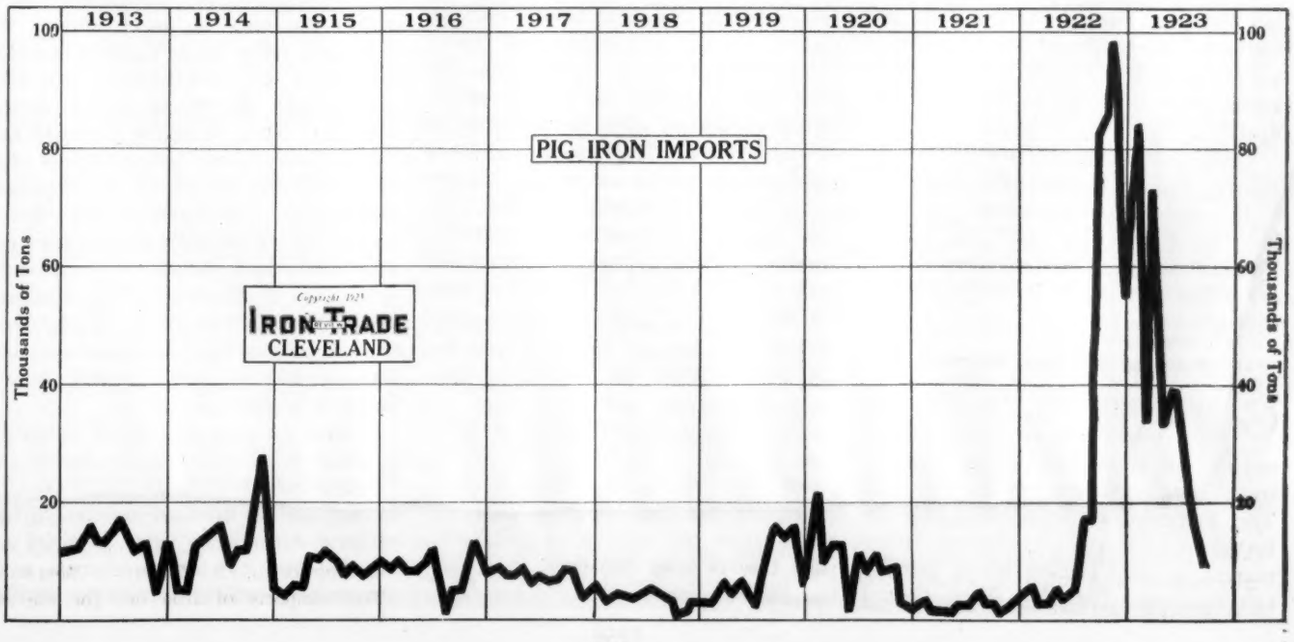
It is understood that the association of manufacturers of malleable iron castings in France, Belgium, and Luxemburg, which was formed at the international foundrymen's congress in Paris in September, will be known tentatively as the Franco-Belgian Malleable Castings association. Marcel Remy, a malleable foundry proprietor of Herstal, near Liege, Belgium, is one of the principal factors in the new organization. The society has engaged Prof. Albert Portevin of Paris as technical expert, and it is the intention of the society to proceed with its work along the lines of the American Malleable Castings association.

FERROMANGANESE AND MANGANESE ORE IMPORTS
Gross Tons

Manganese ore from:	Sept., 1923
Brazil	8,640
Chile	115
British India	4,570
England	252
Turkey-in-Asia	3,005
Turkey-in-Europe	18,593
Total	35,175
Ferromanganese from:	
France, including Luxemburg	4
England	8,752
Total	8,756

IMPORTS OF VARIOUS ORES AND FERROALLOYS
Gross Tons

	September 1923	September 1922	Nine months ended September 1923	Nine months ended September 1922
Ferromanganese	8,756	10,718	73,650	72,011
Ferrosilicon	989	3,615	9,900	12,774
Manganese ore	35,175	46,869	161,413	327,537
Tungsten bearing ore	.....	84	.....	125
Nickel ore	90	148	5,268	148
Total	45,010	61,434	250,231	412,595



Railroads Asking For Machinery

Better Tone Given Market Through Lists From Baltimore & Ohio, Norfolk & Western, New York Central, Southern, Illinois Central, Rock Island and Pennsylvania—Automotive Buying Remains Slack

INCREASED railroad inquiry for machine tools from all parts of the country has had a tendency to brighten the market. In the West the railroads asking for material include the Chicago, Rock Island & Pacific, the Illinois Central, and the Chicago, Burlington & Quincy. In the East the Norfolk & Western, the Southern, the Baltimore & Ohio, the Pennsylvania, and the New York Central all have lists out. Several of these lists call for approximately 25 tools each.

The General Electric is asking for three or four tools and the Westinghouse Electric & Mfg. Co., is expected to start purchasing soon on the recent inquiry in excess of 50 machines.

During the past week sales of tools have shown a slight decline. The sale of a combination journal and axle turning lathe to the Chicago & Northwestern and of six shapers to the Chicago Burlington & Quincy constitutes the only railroad business reported. Other industrial buyers include the American Bosch Magneto Co., which now has closed on all tools on its long list, the General Electric Co., the American Sheet & Tin Plate Co., and a miscellaneous list of single installations to various manufacturing companies.

Conditions appear practically unchanged in the used machinery market, with business hampered by the many auctions that continue to be held throughout the country. Much of the used equipment being sold consists of small tools, the sale of large machines being the exception.

Inquiries for cranes have shown an increase during the week, although sales remain about the same. Locomotive cranes are in greatest demand.

Orders Are Scattered Over Diversified Field

NEW YORK, Oct. 30.—The market for machine tools and shop equipment in this district is featured by inquiries from various railroads including the Baltimore & Ohio, the Norfolk & Western and the Southern, each list involving seven or eight machines. The Southern inquiry calls for two lathes, two steam hammers, one grinder, one boring mill and one radial drill. The Norfolk & Western is inquiring for two lathes. The General Electric is inquiring for three or four machines for the Schenectady, Pittsfield and Lynn works.

The situation in the market during the past week is reported as being generally listless. No large sales were reported and orders placed were scattered over a wide variety of industries.

While orders still are coming through slowly, inquiry is somewhat improved in the eastern foundry equipment market. Most inquiries call for single items, although several substantial lists are either pending or likely to develop shortly.

Railroad Inquiries Improve

CLEVELAND, Oct. 30.—Prospects seem brighter in the machine tool market, due entirely to the increased activity being developed by the railroads. The Baltimore & Ohio has issued an inquiry for 17 tools including lathes, shapers, an axle housing boring machine and grinders. The New York Central also has a list out for tools for the Collinwood, O., and the Elkhart, Ind., shops. The Chicago, Burlington & Quincy has inquired for tools.

Buying by the automotive industry has slackened with regard to standard tools, although makers of special machinery report that orders are being closed at a fairly satisfactory rate. This is due, it is stated, to the fact that automobile manufacturers are not keeping up to the production schedules which were anticipated earlier in the year.

Buying during the week has been slack, being confined in the main to small installations. Several machines were sold to Cleveland manufacturers, and an eastern interest purchased three turret lathes from a local builder. In the woodworking market, sales have not regained momentum after the slow period of the summer. The principal users of woodworking machinery in this district are makers of automobile bodies, and this industry has curtailed production recently. Second hand woodworking tools are being purchased in fair volume.

Business in the used machinery market, as expressed by one dealer, is fair but not good. While an order for large tools is received now and then, the greatest amount of business is being done in small tools, many being of the bench type. During the week one dealer reports the sale of seven large machines from the plant of a local company that is being liquidated. A Columbus company purchased a 2½-inch automatic screw machine and a Cleveland manufacturer took six automatic lathes. Inquiries increased during the week.

Business in the crane market remains the same as reported last week.

Market is Quiet

PITTSBURGH, Oct. 30.—Characterized by a fair amount of buying and inquiring activity, the machine tool market nevertheless is described as quiet by a number of sellers in this territory. This week's feature is the inquiry of the Norfolk & Western railroad for 23 tools as follows: Two each of the following—72-inch plain radial drills, 24-inch vertical turret lathes, 36-inch vertical turret lathes; one each of the following, 48-inch plain radial drill, 3-spindle vertical independent drill, semiautomatic nut facing machine, 20-inch by 6-foot center, heavy duty lathe; 20-inch by 3-foot, 6-inch center, heavy duty lathe; grinder for milling cutters; 60-inch by 12-foot center engine lathe; lathe center grinder; No. 5 vertical milling machine; 36-inch draw cut shaper; 60-inch by 4-foot center tool room lathe; No. 2 universal milling machine; 16-swing by 22-inch center grinder, and a heavy duty radial internal grinder; and three 16-inch by 3-foot, 6-inch center, heavy duty lathes.

Within the next two weeks purchases probably will start on the inquiry of the Westinghouse Electric & Mfg. Co. for in excess of 50 machines referred to two or three weeks ago. Other inquiries are out for one, two or three tools each, the majority calling for single installa-

tions. The American Sheet & Tin Plate Co., which recently purchased six woodworking machines, has started to buy on its inquiry for machine tools, including keyseaters and slotters, one going to the Brown & Zortman Machinery Co., and other equipment being distributed among other sellers.

Recent purchases of the Pennsylvania railroad include various machine tools for Youngwood, Pitcairn and Sharpsburg, Pa., shops, and this road now has an inquiry out for about six or eight woodworking machines. Single sales within the week of new and used equipment includes a 16-inch heavy pattern lathe, a punch press and a 36-inch by 29-foot bed engine lathe, mostly to local users. Prospects are bright for the early sale of at least two large boring mills in the used equipment market where a good demand lately has been enjoyed for large units. Demand for buckets of late has been good, a Monessen, Pa., user ordering four, two each from the G. H. Williams Co., Erie, Pa., and the Blaw-Knox Co., Blawnox, Pa. The Montour railroad ordered one from the Brown Hoist Machinery Co. Crane inquiries at present are plentiful, the total pending here being between 20 and 25. The largest involved is that of the Carnegie Steel Co., referred to last week, for five cranes, including two 75-ton and three 10-ton.

Railroad Buying Features

CHICAGO, Oct. 30.—Machinery business in the Chicago district is only fair, although some dealers report a slightly augmented volume of sales. Railroad activity features the market. The Rock Island railroad is inquiring for one automatic screw machine, one 24-foot by 6-inch heavy turret lathe, one standard duplex motor-driven floor grinder, one 54-foot by 16-inch heavy duty spindle and two No. 5 universal milling machines. The Illinois Central railroad has an inquiry out for one upright motor-driven drill press with a 36-inch table. The Chicago, Burlington & Quincy railroad has placed six 32-inch shapers with Manning, Maxwell & Moore and is expected to close shortly on its inquiry for lathes. David A. Wright, Inc., has sold a combination journal and axle turning lathe to the Chicago & North Western railroad.

New England Sales Quiet

BOSTON, Oct. 30.—Changes in automobile design at this time of year are responsible for some fairly heavy machine tool buying from New England manufacturers. Detroit interests have been in the market during the past week with several new substantial orders rounding out orders placed some weeks ago. The Bosch Magneto Co. at Springfield, Mass., has purchased several more tools completing its long list. This entire purchase, amounting to about $100,000 is for the purpose of adapting accessory equipment to a new type of automobile.

Dealers in New England report a sharp decline in sales during the past week compared with the week previous which showed a good average total. Boston dealers have entered but scattered orders for individual tools and the inquiry which came out a week ago has not developed into orders and now seems somewhat inactive.

Used tool dealers report conditions unchanged. Sales during the week totaled 15 or 20 tools from Boston. Several auction sales recently have placed an increased number of used tools on the market. About 40 tools offered at the army supply base, South Boston, and unsold last week because government minimum prices were too high are again to be offered on a more favorable basis. The General Electric Co. has recently purchased a 25-ton electric traveling crane for a Massachusetts plant. Other crane activity includes inquiry for two 5-ton and one 10-ton industrial cranes.

Simmons Machine Tool Corp., Albany, N. Y., has purchased the machinery and equipment of the Pittsburgh Machine & Tool Co., Pittsfield, Mass., whose real estate was recently sold to the Eaton, Crane & Pike Co., of that city for expansion.

Tool Buying Not Active

MILWAUKEE, Oct. 30.—Manufacturers of machinery are getting better orders from industrial shops, but buying of machine tools has not yet reached an active state. Inasmuch as the machinery trade is not overcrowded and plants do not find it necessary to expand, needs of additional tools are small. Railroad activity is increasing in other centers and local manufacturers expect to receive some of this business. Logemann Bros. Co., maker of hydraulic scrap bundling machines, is adding an erecting shop requiring a 10-ton electric crane.

Crane Awards and Inquiries of the Week

Orders Placed

One 20-ton traveling crane for the General Electric Co. plant, Lynn, Mass., to unnamed bidder.

One 50-ton electric traveling crane for the Georgia Railway & Power Co., Sawtooth, Ga., to the Whiting Corp.

Three brdiges for the Jones & Laughlin Steel Corp., South Side Works, Pittsburgh, to the Morgan Engineering Works, Alliance, O.

One 25-ton locomotive crane for American Sand & Gravel Co., Chicago, to the Browning Co.

Three bridges to the Morgan Engineering Co., Alliance, O. (incorrectly reported elsewhere than this column as going to the Alliance Machine Co., Alliance, O.) for the Jones & Laughlin Steel Corp., Pittsburgh; the buyer to fabricate the steel itself.

One trolley to make a single-hook crane into a 2-hook crane for the Spang, Chalfant Co., Pittsburgh, to the Shaw Electric Crane Works, through Manning, Maxwell & Moore, Inc., Pittsburgh.

One 5-ton, 3-motor electric traveling crane for the West Leechburg Steel Co., Leechburg, Pa., to the Northern Engineering Works, Detroit.

One 25-ton locomotive crane for the National Plate Glass Co., Blairsville, Pa., to the Browning Co., Cleveland.

One 3-ton handpower crane for the H. C. Frick Coke Co., Pittsburgh, to the Whiting Corp.

One 20-ton used Brown Hoist crane for the Stamford Gravel Corp., Stamford, Ont., to Philip T. King, New York.

Two special 2-motor cranes for the *Evening Mail*, New York, to the New Jersey Foundry & Machine Co., New York.

One 1-ton hand-power, 30-foot span crane for the Irvington Smelting & Refining Co., Irvington, N. J., to the New Jersey Foundry & Machine Co., New York.

Orders Pending

20-ton locomotive crane, Pennsylvania railroad, Sharpsville, Pa.; bids being taken.

One 20-ton locomotive crane for the Malconson Coal Co., Detroit, to McMyler Interstate Co., Bedford, O.

One crane or more for the Anchor Drawn Steel Co., 1101 Farmers Bank building., Pittsburgh; fornal inquiry to be issued later.

One 25-ton, 3-motor industrial crane for the East Ohio Mfg. Co., Warren, O., issued through Barton Shover, Oliver building, Pittsburgh engineer; bids being taken on both new and used.

Cranes or hoists for the National Plate Glass Co., Detroit, for its new plant at Blairsville, Pa.; bids being taken.

Five cranes, including two 75-ton and three 10-ton for the Carnegie Steel Co., Pittsburgh; bids being taken.

One 20-ton locomotive crane for the Pennsylvania railroad, Sharpsburg, Pa.; John F. Casey Co., Union Arcade, Pittsburgh, general contractor; bids being taken.

One hand-operated crane for the McCutcheon mills, Northside, Pittsburgh, Carnegie Steel Co.; bids being taken.

Three small cranes for a glass plant in the Pittsburgh territory; bids being taken.

Cranes for bar mill and other expansion work on the Jones & Laughlin Steel Corp.; bids being taken.

One 40-ton crane, for a manufacturer in the Pittsburgh district; bids being taken.

Three cranes, bid upon last summer for plant project, being revived in the Pittsburgh area; new bids being considered.

One large locomotive-type dock crane with 75-foot boom for Memphis, Tenn., terminal of the Jones & Laughlin Steel Corp., Pittsburgh; tentative inquiry out.

Cranes for Park works expansion, Crucible Steel Co. of America, Pittsburgh; formal inquiry to be issued soon.

One 10-ton crane for Logemann Bros. Co., Milwaukee. Bids being taken.

Construction and Enterprise

Concise and Timely Business Building Opportunities from the Field of Industry

East of the Mississippi River

BESSEMER, ALA.—Bessemer Galvanizing Works is reported planning establishment of plant at Twentieth street and Eighteenth avenue to galvanize iron and steel shapes and bolts.

TREDEGAR, ALA.—Hecker Bros., Philadelphia, is reported as contemplating construction of a plant for manufacture of firebrick silica and by-products. Plan daily output of 60,000 bricks.

BRIDGEPORT, CONN.—Jenkins Bros., manufacturer of valves, is expected to complete a new factory before the end of the year.

HARTFORD, CONN.—The United Tool & Die Co., Inc., has been incorporated for $50,000 by James J. Carney, Joseph E. Delaney and Frank R. Velhage.

HARTFORD, CONN.—Fuller Co., Inc., was incorporated for $50,000 authorized capital, $2500 working capital, to manufacture electrical wiring devices, by Sumner F. Fuller, Suffield, Fred P. Gates, and Pearl R. Gates both of West Hartford.

NEW HAVEN, CONN.—The P. G. S. Co., Inc., has been incorporated for $350,000 to manufacturer automobile accessories and mechanical articles by Arthur W. Chambers, H. H. Hitchcock and E. M. Krauss.

SOUTHINGTON, CONN.—Aetna Steel & Iron Co., Inc., filed incorporation paper recently with capital of $65,000 and authorized capital of $170,000. Seth L. Martin, Brookline, Mass., Clinton E. Hobbs, Boston Stephans, Pawtucket, R. I. are incorporators.

WATERBURY, CONN.—Contracts are soon to be let for construction of a 1-story, 40 x 50-foot $40,000 addition for Waterbury Farrel Foundry & Machine Co.

BELLEVILLE, ILL.—Belleville Stamping & Die Co. was incorporated for $15,000 to manufacture and sell tools, dies, etc., by George E. Baker, R. G. Willman and G. D. Klemme.

CHICAGO—The Ross Corp., 208 South La Salle street, was incorporated with $1000 shares no par value to manufacture and deal in machinery, tools, etc., by David Mayer, Richard Mayer and William E. Ross.

CHICAGO—H. Brewer Co., 69 East Thirty-fifth street, has been incorporated for $2500 to manufacture and deal in automobile accessories, by Howard Brewer, Hattie Hayden, and Victoria Evans.

CHICAGO—Lano Co., 1410, 69 West Washington street, was incorporated with 50 shares no par value stock, to manufacture and deal in cleaning machinery by E. E. Laduke, O. W. Lee, R. P. Hummer.

CHICAGO—Martin & Plum, Inc., 5343 Sheridan road, was incorporated for $15,000 to manufacture and deal in all kinds of merchandise and machinery, by Milton J. Foreman, William Karsteele and Lazarus Krinsky.

CHICAGO—The Healthometer Co., 8944 South Hoyne avenue, was incorporated with 30 shares no par value stock to manufacture and deal in weighing scales and accessories, etc., by A. H. Hutchinson, John W. McCarthy and Joseph A. Conerty.

CHICAGO—Acme Metal Mfg. Co., 1211 Clybourne avenue, was incorporated for $240,000 to manufacture and deal in metal and wooden screens and doors, building material, etc., by Willis H. Huston, Lawrence C. Traeger and Helmer Brandell.

CHICAGO—Foster-Bolton Co., 549 West Washington street, was incorporated for $25,000 manufacture and sell steam specialties, by C. W. Foster, E. H. Bolton, and M. B. Bolton. Correspondent is C. H. Kordowski, 1106, 5 North La Salle street.

ANGOLA, IND.—Standard Body Co., plans an addition costing approximately $250,000.

EVANSVILLE, IND.—Evansville Tool Works, Inc., was incorporated for $200,000 preferred and $10,000 common, no par value stock, to manufacture tools with following as directors: Samuel L. Orr, Irving S. Kemp, Casselberry Dunkerson, Frank Lohoff and Samuel Tweedal.

MARION, IND.—Meyers Engineering Co., has been incorporated for $25,000 to manufacture automatic glass machinery by William C. Forbes, John M. Foster and Dallas S. Meyers.

BOSTON—Adams & Durkee Steel Co., Inc., has been incorporated with $50,000 by William E. Adams, William B. Durkee, Newton, Mass., and Virgil C. Brink of Watertown, Mass.

CAMBRIDGE, MASS.—Contract has been awarded for a brick, 3-story, 40 x 100-foot manufacturing building for the Automatic Cone Co.

TAUNTON, MASS.—Weir Stove Co. plans $60,000, 1-story, 50 x 100-foot foundry.

WESTFIELD, MASS.—Westfield Grinding Wheel Co., has been incorporated for $150,000 by George G. Gaylord, William C. Deering and Richard N. Gaylord.

DETROIT—Great Western Smelting & Refining Co., 5201 Loraine street, has awarded construction contract for erection of a 1-story foundry.

DETROIT—Miller, Seldon Electric Co., 1259 Prak Place, McGraw avenue and Twelfth street, plans 2 or 3-story, 60 x 230-foot building.

DETROIT—United Automatic Screw Co., plans $40,000, 1-story, 50 x 150-foot, brick and concrete factory at 3801 Trenton street. R. S. Geranoff, 414 Moffat building, is architect.

DETROIT—Cogsdill Mfg. Co., manufacturer of small tools, plans 1-story, 18 x 35-foot brick and steel factory addition at Epworth boulevard. Stuart A. Cogsdill, 5132 Grand River avenue, in charge.

HAMTRAMCK, Mich.—Detroit Foundry Co., 2642 East Grand boulevard, Detroit, Frank Bromley, president, plans 1-story addition at Vonant and Christopher avenues.

HART, MICH.—Machinery is being installed in the Gem Foundry building recently completed.

NUTLEY, N. J.—Nutley Foundry Co., manufacturer of gray iron castings, plans to rebuild its foundry recently damaged by fire.

FAIRPORT, N. Y.—American Can Co. plans factory addition and alteration. C. J. Preis is engineer. Handled from American company offices at 120 Broadway, New York.

NEW YORK—Aluminum Casket Co., 435 East 102nd street, was damaged by fire recently with loss approximating $60,000.

COLUMBIANA, O.—Colonial Forge & Tool Co. plans construction of addition and installation of equipment.

MINERVA, O.—Lincoln Machine Shop officials have decided to enlarge plant to double present capacity.

SPRINGFIELD, O.—Springfield Brass Co., 821 West Main street, plans addition to foundry, of brick and concrete, 1-story, 30 x 30-foot, costing about $10,000.

TIFFIN, O.—Standard Sanitary Mfg. Co., Bessemer building, Pittsburgh, is planning three 1-story buildings. G. W. Netcher, Tiffin, architect is taking bids.

TOLEDO, O.—Toledo Ferrous Products Co. was incorporated for $500 by Clarence R. Teeter and Charles M. Bulger.

ERIE, PA.—Hollands Mfg. Co., manufacturer of vises and tools, plans $40,000, 1-story, 24 x 130-foot steel frame building at East Eighteenth street. Contracts for construction are let.

ERIE, PA.—Griffin Mfg., Co., manufacturer of cold-rolled strip steel and builders' hardware, has let construction contracts for $45,000, 1-story, 80 x 234-foot factory at Huron street and the New York Central railroad.

KANE, PA.—Kane Mfg. Co., manufacturer of screens has let construction contracts for $31,720, 2-story, 40 x 78-foot manufacturing building.

PHILADELPHIA—Columbia Iron Foundry has been incorporated for $25,000 by George Grosehalp, 644 East Westmoreland street.

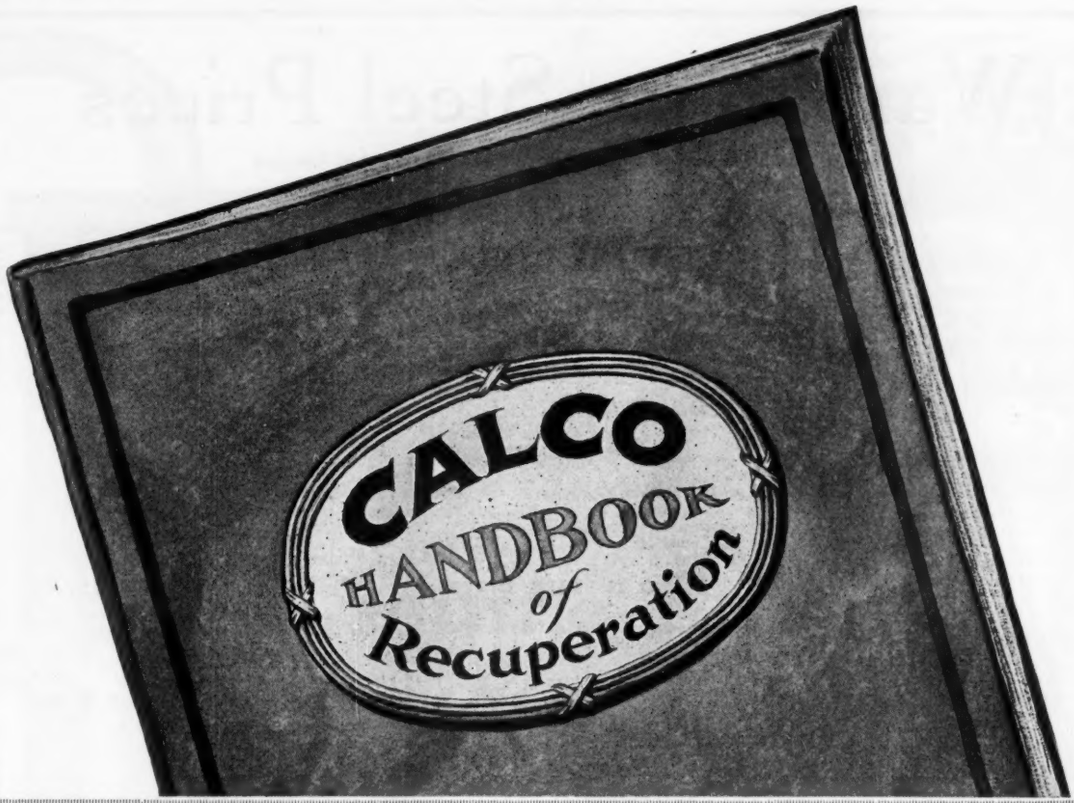
PITTSBURGH—Airtight Steel Tank Co., Mansion street and Baltimore & Ohio railroad, was damaged by fire recently with loss of about $25,000. Plans are being made to rebuild.

YORK, PA.—American Chain Co., Albermarle street, will erect $65,000 addition to its plant for manufacture of automobile bumpers next to its present malleable iron foundry.

MANNINGTON, W. VA.—Monongahela Chain & Mfg. Co. was incorporated by F. W. Vance, W. F. Staggers and Ben H. Ice to manufacture automobile safety chains, window sash fasteners, etc.

FLORENCE, WIS.—Ford Hydroelectric Co., Detroit, Edsel B. Ford, president, has filed plans for a huge water power plant on the Monominee river. A large dam with generating station will be built.

MAYVILLE, Wis.—Feilbach Mfg. Co., A.



This book may save you 50% of your Industrial Furnace Fuel

It is the first comprehensive text book on the subject of Recuperation —the practical method of salvaging heat otherwise wasted up the stack and with this heat raising the temperature of the air burned with your fuel. The process is simple, practical, proven.

Complimentary Copies

of this book, the work of the foremost authority on the subject, will be sent on request to plant executives and superintendents. Get your copy now. This valuable handbook contains the most complete and greatest amount of data on Recuperation ever compiled. Various sections treat of subjects such as:

The Theory of Recuperation.
Complete Set of Charts showing Fuel-Saving by Recuperation, with all Common Fuels.
Charts showing Size of Recuperators necessary with all common Fuels.
Influence of Preheated Air on Combustion.
Influence of Preheated Air on Flame Temperature.
Increased Production due to Preheated Air.
Reduction of Oxidation and Scaling, due to Preheated Air.
Illustrations and Descriptions of Typical Designs of Recuperators.

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You may send me, without charge or obligation, a copy of your recently issued *Handbook of Recuperation.*

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T11-I-3

Warehouse Steel Prices

Quotations in Cents Per Pound at Leading Market Centers

STEEL BARS

Boston	3.515c
Buffalo	3.55c
Chicago	3.20c
Cincinnati	3.40c to 3.50c
Cleveland	3.36c
Detroit	3.35c
Los Angeles	4.30c
New York	3.54c
Philadelphia	3.47c
Pittsburgh	3.15c
San Francisco	3.75c
Seattle	4.10c
St. Louis	3.35c
St. Paul	3.45c

IRON BARS

Boston	3.515c
Buffalo	3.50c
Chicago	3.20c
Cincinnati	3.40c to 3.50c
Detroit	3.35c
New York	3.54c
Philadelphia	3.47c
St. Louis	3.35c

SHAPES, STRUCTURAL

Boston	3.615c
Buffalo	3.65c
Chicago	3.30c
Cincinnati	3.50c to 3.60c
Cleveland	3.46c
Detroit	3.45c
Los Angeles	4.40c
New York	3.64c
Philadelphia	3.57c
Pittsburgh	3.25c
San Francisco	3.60c
Seattle (large shapes)	4.20c
St. Louis	3.45c
St. Paul	3.55c

PLATES

Boston	3.615c
Boston 3/16-inch	3.04c
Buffalo	3.65c
Chicago	3.30c
Cincinnati	3.50c to 3.60c
Cleveland	3.46c
Detroit	3.45c
Detroit, 3/16-inch	3.45c
Los Angeles	4.45c
New York	3.64c
Philadelphia	3.57c
Philadelphia, 3/16-inch	3.82c
Pittsburgh	3.25c
San Francisco	3.75c
Seattle	4.25c
St. Louis	3.45c
St. Paul	3.55c

NO. 10 BLUE ANNEALED SHEETS

Boston, 3/16-inch	4.615c
Buffalo	4.45c
Chicago	4.00c
Cincinnati	4.10c
Cleveland	3.75c to 4.06c
Detroit	4.30c
Los Angeles	5.20c
New York	4.59c
Philadelphia	4.10c
San Francisco	5.25c
Seattle	5.00c
St. Louis	4.10c
St. Paul	4.25c

NO. 28 BLACK SHEETS

Boston	5.45c
Buffalo	5.25c
Chicago	4.70c
Cincinnati	4.90c
Cleveland	4.65c
Detroit	5.15c
Los Angeles	6.50c
New York	4.60c to 4.70c
Philadelphia	5.15c
San Francisco	5.80c
Seattle	6.00c
St. Louis	4.80c
St. Paul	4.95c

NO. 28 GALVANIZED SHEETS

Boston	6.60c
Buffalo	6.35c
Chicago	5.85c
Cincinnati	5.90c
Cleveland	5.60c to 5.80c
Detroit	6.30c
Los Angeles	7.30c
New York	5.50c to 5.70c
Philadelphia	6.25c
San Francisco	6.50c
Seattle	6.75c
St. Louis	5.95c
St. Paul	6.10c

BANDS

Boston	4.315c
Buffalo	4.35c
Chicago	3.95c
Cincinnati	4.00c to 4.10c
Cleveland	4.01c to 4.16c
Detroit	4.10c
Los Angeles	5.20c
New York	4.39c
Philadelphia	4.27c
Pittsburgh	3.95c
San Francisco	4.50c
Seattle	5.10c
St. Paul	4.20c

HOOPS

Boston	5.80c
Buffalo	4.65c
Chicago	4.55c
Cleveland	4.01c to 4.16c
Detroit	4.95c
New York	5.19c
Philadelphia, 1 inch and wider 20 gage and heavier	4.27c
Pittsburgh	3.95c
Seattle	5.50c
St. Paul	4.80c

COLD ROLLED STEEL

Boston (rounds)	4.75c
Boston (shapes)	5.25c
Buffalo (rounds)	4.70c
Buffalo (shapes)	5.20c
Chicago (rounds)	4.55c
Chicago (shapes)	5.05c
Cincinnati (rounds)	4.50c
Cincinnati (shapes)	5.00c
Cleveland (rounds)	4.25c
Cleveland (shapes)	4.75c
Detroit (rounds)	4.55c
Detroit (shapes)	5.05c
Los Angles (rounds)	5.90c
New York (rounds)	4.65c
New York (shapes)	5.15c
Philadelphia (rounds)	4.35c
Philadelphia (shapes)	4.85c
Pittsburgh	4.25c
San Francisco (rounds)	5.75c
Seattle (rounds)	6.00c
St. Paul (rounds)	4.80c

O. Feilbach, president, plans a concrete, 2-story and basement, 75 x 100-foot factory.

RACINE, WIS.—The Lawson Motor Co., 401 Lake avenue, will build a 2-story garage and repairshop, 82 x 120 feet, according to plans by Architects Edmund B. Funston & Co. It will cost about $65,000 with all equipment.

RACINE, WIS.—Burlington Metal Products Co. has opened business in leased quarters at Thurston avenue and Eighteenth street, to manufacture automatic screw machine products. Most of the machinery needed for its new plant has been purchased.

RHINELANDER, WIS.—Plans by Architects Smith, Reynolds & Brandt, Manitowoc, Wis., for a $400,000 junior high and vocational training school have been adopted by the board of education and bids are being taken until Sept. 15.

RIPON, WIS.—Charles Kuehn plans to build a new fireproof machine shop in place of the frame building destroyed by fire Aug. 31. The loss of $10,000 is covered by insurance. Most of the machinery will have to be replaced.

STURGEON BAY, WIS.—Production will begin soon of a patented steel motor stand for Ford service stations and general automotive repair shops by the Peterson-Egeland Mfg. Co. recently incorporated for $25,000.

SUPERIOR, WIS.—Peck-Foster Motor Co. plans one of the largest garages and repair shops in northern Wisconsin on a 100x 150-foot site at Ogden avenue and Belknap street. Approximately $100,000 will be spent for building and machinery.

WAUNAKEE, WIS.—John E. Boettcher and Henry G. Town have organized the J. E. Boettcher Mfg. Co. to take over the business of manufacturing measuring apparatus and devices for measuring liquids, as well as other creamery equipment, established by the former a year ago. The capital stock is $50,000.

WAUSAU, WIS.—A $475,000 addition will be built to Central high school containing a complete manual training department. Oppenhamer & Opal is architect.

WAUWATOSA, WIS.—Engineers Cahill & Douglas, in charge of improvements in the power plant of the Forsyth Leather Co., let the contract for coal and ash handling machinery to the Riley-Fredericks Co., 209 Grand avenue, Milwaukee.

West of the Mississippi

LONG BEACH, CAL.—International Machine Corp., was incorporated for $200,000 with 2000 shares of stock.

COLUMBUS, IOWA.—The Knauss Leonhard Mfg. Co. was incorporated recently for $48,000, by W. Knauss, E. V. Bedwell, E. A. Leonhard, O. M. Calvin, J. T. Leonhard, E. P. Shellabarger, G. R. Bruce and E. O. Newall, to manufacture head lights, spot lights, signal lights, etc., for various transportation vehicles.

MINNEAPOLIS—Hustad Co., J. A. Hustad, 126 South Ninth street, president, plans constructing 1-story brick and stucco steel fabricating plant and warehouse.

ST. PAUL—American Radiator Co. plans $250,000, 2-story, 100 x 106-foot, boiler plant on Minnehaha street between Fairview and Prior avenues. Archer A. Landon, vice president, 1807 Elmwood avenue, Buffalo, N. Y., in charge of building.

NORTH KANSAS CITY, MO.—Contracts for construction of large plant here by American Brake Shoe & Foundry Co., were let recently.

TOPLIN, MO.—Kanck Metals Co., is building a new mill soon to be completed.

SAN BENITO, TEXAS—Southern Iron & Machine Co., has been incorporated for $20,000 by F. H. Widegartner, S. S. Dodds and L. B. Mayer.

Business in Canada

HAMILTON, ONT.—Takefman & Goldblatt, Ltd., has been incorporated to manufacture and deal in metals and carry on a general foundry business, with $400,000 capital, by Thomas A. Simpson, Frederick H. McCallum, Robert Blair and others.

TORONTO, ONT.—Commercial Fixture Co.,

Bourne-Fuller Service

includes immediate shipment of all Iron and Steel materials from Cleveland and Cincinnati

Warehouses

If you are not receiving our Stock-list we shall be glad to send it to you regularly upon request.

Upson Works

Open Hearth Steel Bars for special uses. Also a complete line of Bolts and Nuts. Prompt Shipments.

THE
BOURNE-FULLER CO.
Iron, Steel
Pig Iron
Coke

CLEVELAND

New York **Chicago**
San Francisco
Cincinnati **Detroit**

Industrial Business Changes Recently Announced

THE Pawling & Harnischfeger Co., Milwaukee, manufacturer of cranes, road building machinery and kindred equipment, has placed its sales activities in the eastern district under the supervision of R. P. McCormick, who will have his headquarters at the company's offices, 50 Church street, New York. T. E. Gallagher will continue in charge of the company's Philadelphia offices.

* * *

Interlocked Spring Seat Corp., Chicago, has changed its name to the Continental Cushion Spring Co.

* * *

Washburne Co., Inc., Chicago, has changed its name to the Motor Valve Co.

* * *

David J. Joseph Co., Cincinnati, has opened a New York branch office at 30 Church street, in charge of W. J. Doherty.

* * *

The Wyckoff Drawn Steel Co., Pittsburgh, has recently established a Philadelphia office at 710 Atlantic building, that city, and E. H. Carmany has been transferred there as district manager of sales.

Federal Signal Co., Albany, N. Y., is consolidating with the General Railway Signal Co., Rochester, N. Y.

* * *

Southern California Iron & Steel Co. has moved from its old site at Fourth and Mateo streets, Los Angeles, to a 25-acre tract at Slauson avenue and Huntington Park, that city.

* * *

The McWane Cast Iron Pipe Co., Birmingham, Ala., has opened an office in the Ceneral building, Los Angeles, under direction of H. M. Dudley, western sales manager.

* * *

Moltrup Steel Products Co., Beaver Falls, Pa., manufacturer of cold drawn, milled and ground steel specialties, has opened an office at 421 Stark street, Portland, Oreg., in charge of C. J. Franklin.

* * *

The Blacker Engineering Co., Inc., Grand Central terminal, New York, manufacturer of blacksmithing hammers, has opened an office in Pittsburgh at 421 Wood street with George Hesse as district manager.

The Mohawk Mfg. Co, Waterbury, Conn., maker of metal and wire goods, has moved to Hamlin street, Middletown, Conn.

* * *

Van-Gerry Machine Works has been formed by Frank Van Valkenburg and Willard E. Gerry, purchasers of the plant and equipment of the Mt. Vernon Machine Works, Mt. Vernon, Wash.

* * *

B. F. Wachholz, formerly engaged in the manufacture of wood and metal patterns in Milwaukee, is now located at Appleton, Wis., having leased a part of the former Reliance Motor Truck works. The business is being conducted under the name of Appleton Pattern Works.

* * *

Chase Co. of California, Inc., division of Chase Co., Inc., Waterbury, Conn., established on the Pacific Coast several years ago to distribute brass, bronze and copper products of Chase Metal Works and Chase Rolling Mills and Waterbury Mfg. Co. will move its Los Angeles office to 2461-63 East Eighth street from 417 East Third street.

Ltd., has been incorporated for $50,000 by Frank W. Richardson, Lansing B. Campbell and William C. H. Swinburne, to manufacture and deal in electrical fixtures and supplies.

AHUNTSIO, QUE.—Canada Chemical Works Co., Ltd., 39 Depatie street, will start work in the spring on the erection of a factory here.

HULL, QUE.—The Hull Electric Co. is having plans prepared for concrete dam and power house to be erected at Aylwin, Que. Walter J. Francis & Co., 260 St. James street, Montreal, Que., is engineer. The power house will be 68 x 300 feet and will contain 6 turbines.

LACHUNE, QUE.—Montreal Light, Heat & Power Co., Montreal, plans erection of a power plant here to develop 100,000 horsepower and

(*Continued on Page* 1264)

New Trade Publications

DRIVE SCREWS—The Parker-Kalon Corp., 352 West Thirteenth street, New York, has issued a folder describing the use of hardened metallic drive screws for use in attaching names plates and other similar articles which require permanent fastenings.

ALLOY STEEL—A 25-page booklet issued by the Kinite Co., Milwaukee, contains illustrations and descriptions of special alloy steels for use in the manufacture of sectional, blanking, cutting, embossing and trimming dies, rotary shears, etc.

OIL BURNERS—A folder published by the Anthony Co., Long Island City, N. Y., contains a brief description of the principles and operation of an oil burner whose action is independent of fluid impact, the mixing of the air being accomplished by a definite liquid pressure which forces the fuel into the nozzle. An explanation of the ability of the burner to fix the intensity, length, spread, velocity, volume and quality of the flame is explained.

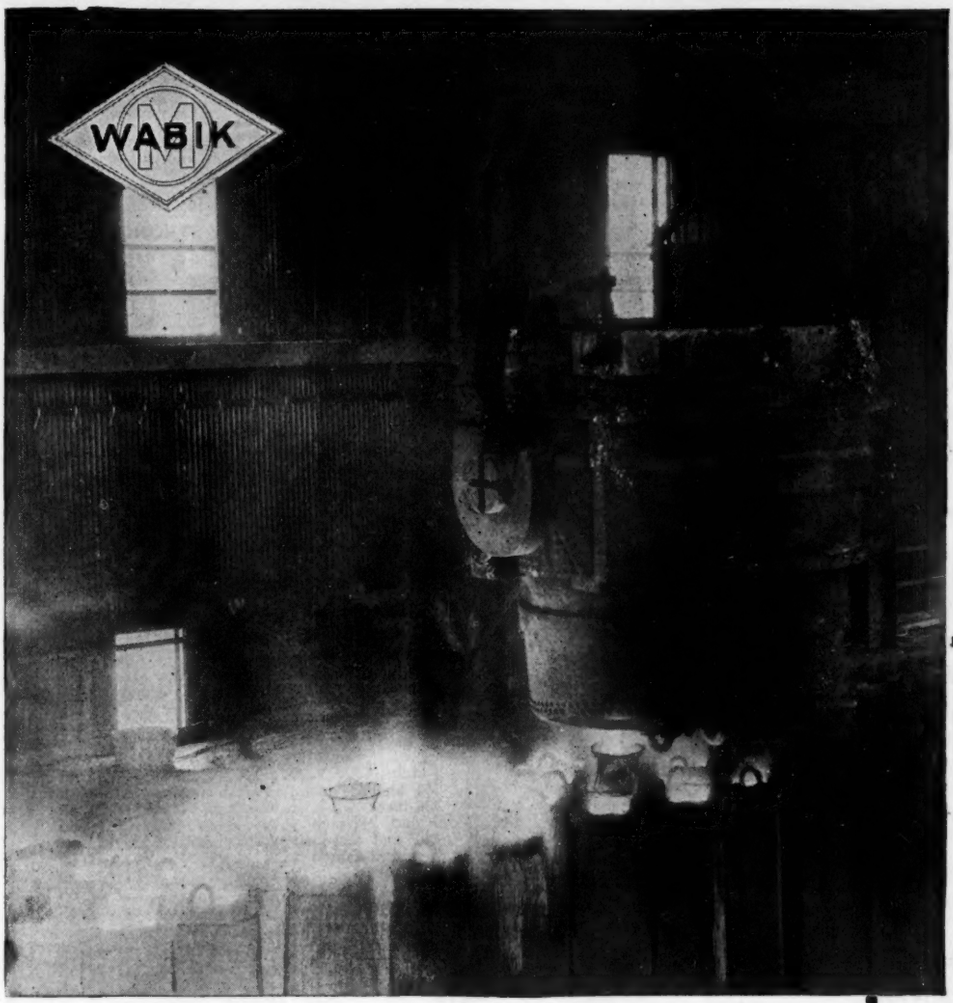
WELDING EQUIPMENT—The Torchweld Equipment Co., Chicago, recently has published a 40-page catalog which contains descriptions and illustrations of oxyacetylene cutting and welding apparatus including both parts and assembled units. Details of construction are shown by means of a diagram.

PIG IRON—The Bethlehem Steel Co., Bethlehem, Pa., has published a book describing the composition, manufacture and uses in foundry work of a nickel-chromium iron which is obtained from Mayari ore. Among the uses for which the iron is recommended are pump castings, cylinder liners, cylinder heads, retorts, etc. A large number of illustrations of finished products containing the iron are shown.

ALTERNATING CURRENT MOTORS—A small booklet in which polyphase squirrel-cage induction motors are illustrated and discussed has been published by the Century Electric Co., St. Louis. The adaptation of the motor to uses such as the driving of printing presses, kneading machines, blowers, pumps, lathes, etc., is shown in the leaflet.

LABOR SAVERS—A catalog of foundry labor saving devices is being issued by the Adams Co., Dubuque, Iowa. Molding presses, double rod squeezers, universal molders, heavy duty squeezers, and small equipment are illustrated and described. The back of the book is devoted to the subject of cast match plates, their use and the method of making them.

WABIK METAL



Pouring a bottom-cast heat in groups of twelve, size 15" x 16" ingots. This size of ingot if top cast would be poured in 25 seconds; but by our "bottom-pour" method an average of *four minutes* is required to pour each ingot.

This slow pouring insures a longer time for the elimination of injurious gases, and reduces the amount of "pipe" in the ingot.

SHEET BARS INGOTS

Other Specialties:

AUTOMOBILE SHEETS

Body Stock; Flat Fender and Hood Stock; Cowl Stock; Radiator Casing Stock; Crown Fender Stock.

METAL FURNITURE SHEETS
PICKLED and ANNEALED
ENAMELING STOCK
For Kitchen Utensils

MILK CAN STOCK

"Mansfield" Steel is the ultimate in Sheet Bars and in Sheets. It means satisfaction to the many users. Constant study of the needs of users, and continuous application of the results of such study, in the way of improved methods in our plants has established a reputation for reliability unsurpassed.

SHEET BARS
INGOTS

VITREOUS ENAMELING

STOVE DOOR PANELS: SPLASHER BACKS: BROILER PANS: TABLE TOPS: REFRIGERATORS: SIGNS: and other flat work.

MANSFIELD SHEET & TIN PLATE COMPANY

MANSFIELD, OHIO

DISTRICT SALES REPRESENTATIVES

The L. D. Rockwell Co., No. 2 Rector St., New York, N. Y.
Mr. D. B. Cory, 1018 Standard Oil Building, Chicago, Ill.
Mr. Geo. W. House, 1822 Ford Building, Detroit, Mich.
The L. D. Rockwell Co., 1201 National Bank Building, Cleveland, Ohio.
Walter G. Clark, Inc., 106 N. Third St., St. Louis, Mo.
Walter G. Clark, Inc., 313 American Bank Bldg., Kansas City, Mo.
Mr. Edwin Schofield, 45 Jarvis St., Toronto, Ont., Canada.
Mr. C. H. Beach, 617 Merchants Bank Bldg., Indianapolis, Ind.
Mr. A. P. Grenier, 640 Endicott Bldg., St. Paul, Minn.
Mr. Herbert P. Hill, 401 Continental Trust Bldg., Washington, D.C.
Wm. P. Horn Co., 237 Rialto Bldg., San Francisco, Cal.
Wm. P. Horn Co., 301 Kerchoff Bldg., Los Angeles, Cal.
Wm. P. Horn Co., Dekum Building, Portland, Ore.
Wm. P. Horn Co., 1426 L. C. Smith Bldg., Seattle, Wash.

Throughout The West

(*Continued from Page 1262*)

cost $2,000,000. It is expected that construction will be started this year.

MONTREAL, QUE.—Laurier Pattern Works, 346 Delorimer street, J. Laurie, purchasing agent, is in the market for woodworking lathes.

MONTREAL, QUE.—Caron Freres has started work on erection of a 10-story factory on Bleury street to cost $750,000.

QUEBEC—The Canadian National Railways contemplate building addition to its St. Malo shops here to cost $37,000.

RIVIERES DES PRAIRIES, QUE.—Preliminary work has been started on the $7,000,000 power development project here for the Back River Power Co., 35 Common street, Montreal, Que. Owners are to take bids on balance of contracts in about a month.

TORONTO, ONT.—The Commercial Fixture Co., Ltd., has been incorporated to manufacture electrical fixtures, equipment, machinery, etc., with $50,000 capital stock; by Frank W. Richardson, Lancing B. Campbell, William C. H. Swineburne and others of Toronto as provisional directors.

Iron and Steel Prices

Iron Ore

LAKE SUPERIOR ORES
Per Gross Ton Lower Lake Ports

Old range bessemer, 55 per cent iron.$6.45
Mesabi bessemer, 55 per cent iron.... 6.20
Old Range nonbessemer, 51½ per cent iron 5.70
Mesabi nonbessemer, 51½ per cent iron 5.55

EASTERN LOCAL ORES
Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic, 53 to 63 per cent ..... 10.00 to 11.00
Copper free low phosphorus 53 to 65 per cent..... 13.25 to 16.50

FOREIGN IRON ORE
Cents per unit, c.i.f. Atlantic ports

Spanish low phosphorus, 52 to 54 per cent ..... 9.00 to 10.50
Algerian low phosphorus, 52 to 54 per cent ..... 10.00 to 11.00
Swedish and Norwegian low phosphorus, 68 per cent.... nominal
Swedish foundry or basic, 66 to 68 per cent..... 10.50 to 10.75
Spanish foundry or basic, 50 to 54 per cent..... 8.00 to 9.50

Manganese Ore

Prices do not include duty at rate 1 cent per pound of metallic manganese contained.

Brazilian, minimum 47 per cent nominal
Indian, minimum 47 per cent .....40 to 44 cents c.i.f. tidewater
Caucasian, 53 to 55 per cent .....41 to 42 cents c.i.f. tidewater

Fluor Spar

85 and 5% grade

Washed gravel, Kentucky and Illinois mines, per net ton.$20.00 to $23.50
Washed gravel, imported, duty paid eastern tidewater, per net ton.....$20.00

Rivets

Structural rivets, Pittsburgh.. 2.75c to 3.00c
Rivets, 7/16-in. and smaller..... .....65 and 10 to 65 and 5 off

Nuts and Bolts

NUTS
(Up to 1¼ and 1⅛ inches inclusive)

Hot pressed square or hexagon blank .....$4.25 fo list
Hot pressed square or hexagon tapped .....$4.00 off list
Cold punched square or hexagon blank .....$4.00 off list
Cold punched, square or hexagon, ...$4.00 off list
Cold punched semifinished hexagon nuts ⅝-inch and larger.....75 and 5 off
Cold punched semifinished hexagon nuts 9/16-inch and smaller..80 and 5 off
Price f.o.b. Pittsburgh, Packages of 50.

CARRIAGE BOLTS
(¾ x 6 inches, smaller and shorter)

Rolled thread.....60 and 5 off
Cut thread .....50, 10 and 5 off
Larger and longer.....50, 10 and 5 off

MACHINE BOLTS
(⅜ x 4 inches, hot pressed nuts)

Rolled thread .....60.10 and 5 off
Cut thread .....60 and 5 off
Larger and longer.....60 and 5 off
(⅜ x 4 inches, cold punched nuts)
Cut thread .....50, 10 off
Larger and longer.....50, 10 off
Lag screws .....65 and 5 off
Plow bolts Nos. 1, 2 and 3 heads.... .....50 and 10 off
4 to 10 heads .....50-10 + 20 off
Stove bolts .....75, 10 and 5 off
Tap bolts .....25 and 10 off
Bolt ends with hot pressed nuts..... .....60 and 5 off
Bolt ends with cold punched nuts.... .....45, 10 and 5 off
Blank bolts .....60 and 5 off
Rough stud bolts with nuts ....50, 10 and 5 off

WASHERS

Wrought washers.....$5.00 to 5.10 off

Steel Pipe

(Effective April 19, 1923)
Pittsburgh basing discounts, jobbers' carloads.

Butt Weld

	Black	Galvanized
⅛-inch	45	19½
¼ and ⅜-inch	51	25½
½-inch	56	42½
¾-inch	60	48½
1 to 3-inch	62	50½

Lap Weld

2-inch	55	43½
2½ to 6-inch	59	47½
7 to 8-inch	56	43½
9 and 10-inch	54	41½
11 and 12-inch	53	40½

REAMED AND DRIFTED
Butt Weld

1 to 3-inch	60	48½

Lap Weld

2-inch	53	41½
2½ to 6-inch	57	45½

EXTRA STRONG—PLAIN ENDS
Butt Weld

⅛-inch	41	24½
¼ and ⅜-inch	47	30½
½-inch	53	42½
¾-inch	58	47½
1 to 1½-inch	60	49½
2 to 3-inch	61	50½

Lap Weld

2-inch	53	42½
2½ to 4-inch	57	46½
4½ to 6-inch	56	45½
7 to 8-inch	52	39½
9 and 10-inch	45	32½
11 and 12-inch	44	31½

DOUBLE EXTRA STRONG
Butt Weld

½-inch	42	32½
¾ to 1½-inch	45	35½
2 to 2½-inch	47	37½

Lap Weld

2-inch	41	32½
2½ to 4-inch	43	34½
4½ to 6-inch	42	33½
7 to 8-inch	38	25½

Wrought Iron Pipe

(Effective Jan. 23, 1923)
Pittsburgh basing discounts, jobbers, carloads

THREADS AND COUPLINGS

Butt Weld

	Black	Galvanized
¼ and ⅜-inch	+11	+39
½-inch	22	2
¾-inch	28	11
1 to 1½-inch	30	13

Lap Weld

1¼ and 1½-inch.....	Upon application	
2-inch	23	7
2½ to 6-inch	26	11
3 to 6-inch	28	13
7 to 12-inch	26	11

PLUGGED AND REAMED
Two points less than above

EXTRA STRONG, PLAIN ENDS
Butt Weld

¼ and ⅜-inch	+19	+54
½-inch	21	7
¾-inch	28	12
1 to 1½-inch	30	14

Lap Weld

2-inch	23	9
2½ to 4-inch	29	15
4½ to 6-inch	28	14
7 to 8-inch	21	7
9 to 12-inch	16	2

DOUBLE EXTRA STRONG
Butt Weld

½-inch	+47½	+59½
¾-inch	+28	+40
1-inch	+34	+46
1¼-inch	+28	+40
1½-inch	+27	+39

Lap Weld

2 and 2½-inch.....	+13	+25
3 to 4-inch	+ 8	+17
4½ to 6-inch	+ 9	+18
8-inch	+12	..

Boiler Tubes

L. C. L. discounts. C. L. 4 points larger

STEEL (Lap welded)
(Effective April 19, 1923)

2 and 2¼-inch ..... 23 off
2½ and 2¾-inch ..... 33 off
3-inch ..... 36 off
3¼ to 3¾-inch .....38½ off
4 to 13-inch ..... 42 off

CHARCOAL IRON
(Effective April 12, 1923)

1½-inch .....+22
1¾-inch .....+12
2 and 2¼-inch .....+ 2
2½ to 3-inch 3
3¼ to 4½-inch 5

SEAMLESS COLD DRAWN
(Effective April 19, 1923)

1-inch ..... 51 off
1¼ and 1½-inch ..... 48 off
1¾-inch ..... 27 off
2 and 2¼-inch ..... 18 off
2½ and 2¾-inch ..... 28 off
3 and 3¼-inch ..... 32 off
3½ and 3¾-inch ..... 33 off
4-inch ..... 37 off
4½ and 5-inch ..... 29 off

SEAMLESS HOT ROLLED

3 and 3¼-inch ..... 34 off
3½ and 3¾-inch ..... 35 off
4-inch ..... 39 off

SEAMLESS STEEL MERCHANT BOILER TUBES

Extras:

Add $8 per net ton for more than four gages heavier than standard and add 10 per cent to theoretical weight.

Add 5 per cent for lengths over 24 feet and not over 26 feet.

Smaller tubes than 1-inch and lighter than standard gage to be sold at mechanical tubing list and discount.

Intermediate sizes and gages not listed above take price of next larger outside diameter and heavier gage.

SEAMLESS STEEL MECHANICAL TUBING
Base Discounts

Carbon, 0.10 to 0.20 per cent..... 83 off
Carbon, 0.30 to 0.40 per cent..... 81 off
Carbon, 0.40 to 0.50 per cent.....net price
Plus differentials and extras for cutting

SEAMLESS STEEL LOCOMOTIVE AND SUPER-HEATER TUBES
(Effective April 19, 1923)
Net prices per foot f.o.b. Pittsburgh

Outside diameter	Gage	Price
2-inch	12-gage	15c
2-inch	11-gage	16c
2-inch	10-gage	17c
2¼-inch	12-gage	17c
2¼-inch	11-gage	18c
2¼-inch	10-gage	20c
3-inch	7-gage	35c
1½-inch	9-gage	15c
5⅜-inch	9-gage	55c
5½-inch	9-gage	57c

Plus usual extras for forming and for long lengths.

SIVYER CASTINGS
DEPENDABLE

Axle casting for haul-off on wagon trailer

Simplifying built-up parts with Sivyer Steel Castings

A MANUFACTURER of trucks and trailers formerly built up the haul-off for a wagon trailer with steel straps, bolts and pieces of wood. In this process he used fifty-four pieces of material consisting of twenty-nine bolts, eight steel straps, four iron castings, two U bolts, two strap bolts, two hook bolts, two steel plates and five pieces of wood. To simplify the construction of the part he turned to Sivyer Steel and now uses a total of only eighteen pieces consisting of four Sivyer Castings, ten straight bolts, two rods and two steel straps. The result to him is a considerable reduction of assembly cost and a much stronger and simpler unit. Other manufacturers have made similar gains by replacing built up parts with stronger and less complicated units of Sivyer Electric Steel Castings.

Send Blue Prints

A number of aggressive manufacturers have divided their steel parts into three general classes: those that can be profitably forged; those that cannot be forged economically, or at all, but can be cast in ordinary steel; and those that can be cast most reliably and economically in Sivyer Electric Steel.

The last class includes especially castings with thin and sharply varying sections, and castings that have to be true to pattern, clean and smooth in order to fit the assembly with the minimum of finishing.

With Sivyer Electric Steel we have been able to show certain engineers very decided advantages and economies, not only as against ordinary steel castings and hammered forgings, but also as against malleable castings and fabricated steel.

A certain manufacturer formerly fabricated rocker beams for a crawler chassis by welding two stampings and then pressing in, and welding, sections of steel tubing. The shortcomings, and unnecessary expense of this method were not realized until it was found that the stampings did not have the body required to carry certain desirable attachments. Forgings were impractical. Open hearth practice does not permit the high temperatures necessary for casting thin sections such as those of the design in question. The manufacturer's organization naturally turned to Sivyer Electric Steel. It proved to have all the qualities desired and effected an appreciated reduction in the final cost of the part.

In a number of other cases we have been able to free certain engineers from the handicaps of hammered forgings and in effect give them much greater freedom in design.

We are especially interested in making experimental castings for manufacturers. If you will send us your blue prints for troublesome parts, together with a statement of your difficulties, we will study the problems involved and recommend possible solutions without obligation on your part.

SIVYER STEEL

SIVYER STEEL CASTING COMPANY, MILWAUKEE

Iron and Steel Production

Compiled By IRON TRADE REVIEW

Pig Iron

	-Stacks- No.	In	—Output— Total	Av. daily
1907				
January	376	311	2,174,801	70,155
February	374	308	2,047,036	73,109
March	377	304	2,186,709	70,539
April	378	327	2,226,708	74,223
May	391	329	2,291,030	73,904
June	392	341	2,237,420	74,580
July	396	335	2,253,243	72,685
August	397	329	2,243,656	72,376
September	399	329	2,174,148	72,471
October	401	314	2,359,690	76,119
November	398	226	1,820,558	60,685
December	398	154	1,234,733	39,830
Total			25,249,732	
1908				
January	398	139	1,081,813	34,897
February	401	150	1,086,809	37,476
March	398	154	1,229,856	39,672
April	398	146	1,155,122	38,504
May	396	145	1,168,002	37,677
June	395	154	1,106,300	36,876
July	397	166	1,228,604	39,632
August	399	181	1,366,019	44,065
September	399	189	1,416,252	47,208
October	400	200	1,573,824	50,764
November	402	212	1,582,314	52,744
December	403	221	1,723,664	55,602
Total			15,718,579	
1909				
January	406	234	1,787,473	57,683
February	407	233	1,682,470	60,088
March	406	229	1,822,024	58,793
April	406	224	1,731,406	57,687
May	407	236	1,866,757	60,218
June	408	240	1,929,929	64,334
July	409	258	2,088,620	67,375
August	412	278	2,232,642	72,021
September	413	297	2,378,655	79,201
October	413	309	2,589,681	83,538
November	414	311	2,532,740	84,425
December	416	314	2,682,702	86,539
Total			25,325,099	
1910				
January	416	311	2,599,995	83,871
February	417	311	2,429,525	86,768
March	417	310	2,588,736	83,508
April	418	291	2,477,700	82,590
May	419	279	2,374,802	76,607
June	420	271	2,288,279	76,276
July	420	254	2,158,124	69,617
August	422	244	2,103,791	67,864
September	420	234	2,048,461	68,282
October	421	230	2,086,205	67,297
November	421	218	1,910,385	63,679
December	421	193	1,779,899	57,416
Total			26,845,902	
1911				
January	421	210	1,766,658	56,985
February	421	226	1,781,285	63,617
March	421	236	2,165,764	69,863
April	421	220	2,044,904	68,163
May	421	206	1,871,888	60,367
June	421	202	1,773,282	59,109
July	423	196	1,776,108	57,294
August	423	206	1,921,832	61,995
September	423	216	1,973,918	65,797
October	421	214	2,092,061	67,486
November	421	214	1,999,100	66,637
December	422	215	2,032,301	65,558
Total			23,198,601	
1912				
January	421	227	2,052,806	66,220
February	422	235	2,098,796	72,372
March	420	237	2,411,529	77,791
April	421	239	2,377,621	79,254
May	423	243	2,503,341	80,753
June	424	242	2,433,737	81,125
July	422	245	2,402,567	77,502
August	423	255	2,500,163	80,650
September	419	262	2,444,454	81,482
October	422	280	2,683,645	86,569
November	423	289	2,639,562	87,985
December	423	291	2,777,292	89,590
Total			29,325,513	
1913				
January	423	297	2,787,800	89,929
February	423	306	2,578,670	92,095
March	423	278	2,762,823	89,123
April	421	297	2,754,353	91,812
May	421	285	2,816,825	90,865
June	422	283	2,616,883	87,229
July	422	264	2,558,275	82,525
August	424	260	2,537,018	81,839
September	425	258	2,494,098	83,137
October	425	244	2,539,924	81,933
November	424	225	2,229,960	74,322
December	424	191	1,976,138	63,746
Total			30,652,767	
1914				
January	423	199	1,879,336	60,624
February	423	219	1,888,607	67,450
March	423	232	2,341,551	75,534
April	422	212	2,261,501	75,383
May	422	198	2,097,019	67,646
June	422	193	1,904,566	63,486
July	422	187	1,955,324	63,075
August	422	187	1,996,483	64,403
September	422	180	1,882,718	62,757
October	422	162	1,767,227	57,007
November	421	150	1,501,269	50,042
December	421	154	1,495,325	48,236
Total			22,970,926	
1915				
January	421	165	1,591,024	51,323
February	421	179	1,666,592	59,521
March	421	190	2,046,280	66,009
April	421	197	2,114,518	70,484
May	421	207	2,255,157	72,747
June	421	221	2,369,932	78,998
July	421	234	2,563,311	82,687
August	421	246	2,774,825	89,510
September	420	266	2,834,342	94,478
October	420	276	3,120,340	100,656
November	421	285	3,035,235	101,174
December	421	295	3,201,605	103,278
Total			29,573,161	
1916				
January	421	304	3,171,878	102,319
February	421	312	3,078,548	106,157
March	422	315	3,327,630	107,343
April	422	320	3,225,496	107,517
May	423	321	3,364,584	108,535
June	423	325	3,213,818	107,127
July	419	316	3,221,127	103,907
August	419	317	3,197,838	103,156
September	419	326	3,208,041	106,935
October	419	328	3,508,180	113,167
November	420	322	3,317,805	110,593
December	422	309	3,184,178	102,715
Total			39,019,123	
1917				
January	422	310	3,159,839	101,930
February	422	317	2,649,935	94,641
March	423	331	3,255,813	105,026
April	425	333	3,328,061	110,936
May	425	340	3,413,677	110,119
June	427	347	3,260,234	108,675
July	429	351	3,337,442	107,659
August	431	357	3,238,970	104,483
September	431	342	3,140,742	104,691
October	433	354	3,296,286	106,332
November	434	344	3,198,597	106,620
December	435	321	2,885,380	93,077
Total			38,164,976	
1918				
January	435	294	2,403,227	77,523
February	435	319	2,318,242	82,723
March	438	338	3,209,996	103,548
April	437	351	3,273,355	109,112
May	437	360	3,451,884	111,351
June	437	353	3,316,148	110,538
July	437	364	3,408,584	109,954
August	439	371	3,378,479	108,983
September	438	364	3,413,223	113,774
October	437	364	3,482,392	112,335
November	437	360	3,347,844	111,595
December	435	351	3,434,114	110,778
Total			38,437,488	
1919				
January	435	330	3,306,279	106,654
February	435	311	2,943,347	105,120
March	435	279	3,088,023	99,614
April	435	216	2,474,374	82,479
May	433	197	2,107,729	67,991
June	433	199	2,114,028	70,467
July	434	240	2,424,212	78,200
August	432	266	2,742,081	88,453
September	433	163	2,480,790	82,692
October	432	216	1,864,424	60,142
November	432	252	2,407,369	80,244
December	432	262	2,626,074	84,711
Total			30,578,730	
1920				
January	432	285	3,012,373	97,172
February	432	305	2,984,257	102,904
March	433	315	3,375,768	108,895
April	433	278	2,752,670	91,754
May	433	297	2,991,825	96,510
June	433	302	3,046,623	101,553
July	434	291	3,043,918	98,190
August	434	306	3,145,536	101,468
September	434	317	3,124,308	104,143
October	435	290	3,288,341	106,075
November	435	255	2,935,081	97,836
December	435	202	2,700,268	87,105
Total			36,400,968	
1921				
January	436	184	2,414,753	77,895
February	436	155	1,929,394	68,906
March	436	103	1,594,866	51,447
April	436	96	1,190,751	39,691
May	436	90	1,215,272	39,202
June	436	74	1,064,007	35,466
July	435	69	864,642	27,892
August	436	69	954,901	30,802
September	435	84	985,795	32,859
October	435	95	1,234,450	39,821
November	429	120	1,414,958	47,165
December	429	123	1,642,775	52,992
Total			16,506,564	
1922				
January	430	127	1,645,804	53,090
February	429	139	1,630,180	58,220
March	429	155	2,035,908	65,674
April	429	161	2,070,161	69,005
May	427	175	2,309,348	74,495
June	427	191	2,362,455	78,748
July	427	170	2,403,030	77,517
August	427	143	1,810,665	58,408
September	427	189	2,024,008	67,466
October	428	218	2,629,655	84,827
November	428	241	2,846,110	94,870
December	428	253	3,083,520	99,468
Total			26,850,844	
1923				
January	428	261	3,228,226	104,136
February	424	278	2,993,918	106,925
March	424	295	3,523,595	113,664
April	423	311	3,547,012	118,233
May	423	322	3,868,486	124,790
June	424	322	3,667,868	122,262
July	418	299	3,684,677	118,860
August	418	270	3,448,886	111,254
September	418	255	3,123,611	104,120

Ingots and Castings

By American Iron and Steel Institute

	Ingots	Castings	Total
1918	43,051,022	1,411,410	44,462,432
1919	33,694,795	976,437	34,671,232
1920	40,881,392	1,251,542	42,132,934
1921	19,184,084	559,713	19,743,797
1922	34,568,418	1,034,508	35,602,926

Monthly Ingot Output

Gross Tons

1922	84.15 per cent of capacity	Calculated total
January	1,593,482	1,891,857
February	1,745,022	2,071,772
March	2,370,751	2,814,667
April	2,444,513	2,902,240
May	2,711,141	3,218,794
June	2,634,477	3,127,775
July	2,487,104	2,952,806
August	2,214,582	2,629,256
September	2,373,779	2,818,261
October	2,872,415	3,410,265
November	2,889,297	3,430,309
December	2,779,890	3,300,416
Total	29,116,453	34,568,418
1923	95.35 per cent	
January	3,644,629	3,822,369
February	3,294,264	3,454,918
March	3,858,675	4,046,854
April	3,760,997	3,944,412
May	4,000,695	4,195,800
June	3,574,567	3,748,890
July	3,350,829	3,514,241
August	3,506,755	3,677,771
September	3,159,283	3,313,354

A Help Toward the 8 Hour Day

One big help toward solving the problems of the eight hour day will be in the increased use of labor saving machinery. Always among the foremost manufacturers of this equipment, Brownhoist has been faithfully serving the steel industry for many years.

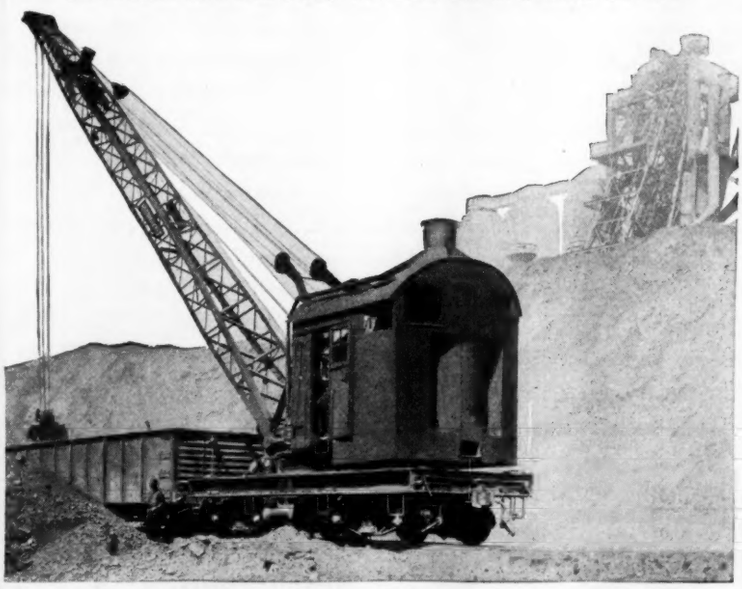
Today hundreds of Brownhoists are being used at steel mills all over the country for speeding up the handling of their materials and consequently their production.

The flexibility, speed and dependability with which a Brownhoist crane handles ore, coal, pigs, scrap, etc., makes it a very useful and economical unit under practically any handling conditions.

Brownhoist builds many different types of cranes and conveyors. We will gladly furnish you with literature, estimates and layouts on any of this equipment.

The Brown Hoisting Machinery Co., *Cleveland, O.*

Branch Offices: New York, Chicago, Pittsburgh, San Francisco, New Orleans, London, Eng.
Products: Locomotive Cranes, Bridge Cranes, Dock Machinery, Conveyors, Buckets.



BROWNHOIST

MATERIAL HANDLING MACHINERY

Iron and Steel Scrap Prices

CORRECTED TO TUESDAY NOON GROSS TONS DELIVERED TO CONSUMER

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	13.00 to 14.00
Boston (dealers)	10.00 to 10.50
Buffalo	15.00 to 16.00
Chicago	13.50 to 14.00
Cleveland	14.25 to 14.75
Cincinnati	12.00 to 12.50
Detroit (dealers)	12.00 to 12.50
Eastern Pennsylvania	15.00
New York (dealers)	10.50 to 11.00
Pittsburgh (dealers)	15.00 to 15.50
St. Louis	12.00 to 12.50
Valleys (nominal)	15.75 to 16.00
No. 1 railroad steel New York (dealers)	11.00 to 11.50

BUNDLED SHEETS

Buffalo	$15.00 to 15.50
Cleveland	10.50 to 11.00
Cincinnati	9.00 to 9.50
Detroit	7.50 to 8.00
Eastern Pennsylvania	10.50 to 11.50
Pittsburgh	12.50 to 13.00
St. Louis	7.50 to 8.00
Valleys	11.00 to 11.50

STEEL RAILS, SHORT

Birmingham	16.00 to 16.50
Boston (dealers)	11.50 to 12.00
Chicago	16.00 to 16.50
Cincinnati	17.50 to 18.00
Cleveland	13.50 to 13.75
St. Louis	16.00 to 16.50

STOVE PLATE

Birmingham	15.00 to 16.00
Boston (consumers)	16.50 to 17.00
Buffalo	17.00 to 17.50
Chicago	17.50 to 18.00
Cincinnati (net ton)	9.00 to 9.50
Cleveland	14.00 to 15.00
Detroit (net ton) (dealers)	10.00 to 10.50
Eastern Pennsylcania	16.50 to 17.00
New York (dealers)	12.50 to 13.00
Pittsburgh	13.50 to 14.00
St. Louis	14.50 to 15.00

LOW PHOSPHORUS

Buffalo	21.00 to 22.00
Cincinnati	13.00 to 13.50
Eastern Pennsylvania	21.00 to 22.00
Pitts. billets and bloom crops.	21.50 to 22.00

SHOVELING STEEL

Chicago	13.25 to 13.75
Pittsburgh	12.50 to 13.00
St. Louis	12.00 to 12.50

KNUCKLES, COUPLRS, SPRINGS

Chicago	19.00 to 19.50
Eastern Pennsylvania	19.00 to 20.00
Pittsburgh	18.00 to 18.50
St. Louis	16.00 to 16.50

SHEET CLIPPINGS, LOOSE

Chicago	6.00 to 6.50

COMPRESSED SHEETS

Buffalo	14.00 to 15.00
Chicago	10.50 to 11.00
Cleveland	12.50 to 1275
Detroit (dealers)	9.00 to 9.50
Pittsburgh	14.00 to 14.50
Valleys	13.75 to 14.00

FROGS, SWITCHES, GUARDS

Chicago	13.50 to 14.00
Eastern Pennsylvania	15.00
St. Louis	12.50 to 13.00

BOILER PLATE, CUT

St. Louis	7.50 to 8.00

ANGLE BARS—STEEL

Chicago	15.00 to 15.50
St. Louis	14.00 to 14.50

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	13.00 to 14.00
Boston (dealers)	11.00 to 12.00
Buffalo	15.00 to 16.00
Cleveland, No. 1	12.00 to 12.50
Chicago, No. 1	13.50 to 14.00
Chicago, No. 2	13.50 to 14.00
Cincinnati, No. 1	11.50 to 12.00
Detroit, No. 2	11.50 to 12.00
Eastern Pennsylvania	17.50 to 18.00
Pittsburgh, No. 1	12.00 to 12.50
Pittsburgh, No. 2	15.00 to 15.50
New York, No. 1 (dealers)	14.50 to 15.00
St. Louis, No. 1	13.00 to 13.50
St. Louis, No. 2	13.25 to 13.75

WROUGHT PIPE

Boston (dealers)	9.50 to 10.00
Buffalo	13.00 to 14.00
Eastern Pennsylvania	14.50 to 15.00
New York (dealers)	9.50 to 10.00

YARD WROUGHT

Boston	10.00 to 10.50
Eastern Pennsylvania	15.00 to 16.00

CITY WROUGHT

New York, long	13.50 to 14.00

BUSHELING

Buffalo	14.50 to 15.50
Chicago, No. 1	11.50 to 12.00
Chicago, No. 2	7.50 to 8.00
Cincinnati, No. 1	9.50 to 10.00
Cleveland, No. 1	9.50 to 9.75
Cleveland, No. 2	7.50 to 7.75
Detroit, No. 1	10.00 to 10.50
Detroit, No. 2 (new)	9.00 to 9.50
Detroit, No. 2 (old)	7.50 to 8.00
Eastern Pennsylvania	14.50 to 15.00
Pittsburgh, No. 1	14.00 to 14.50
St. Louis, No. 1	12.00 to 12.50

MACHINE SHOP TURNINGS

Birmingham	8.00 to 9.00
Boston (dealers)	7.00 to 7.50
Buffalo	9.00 to 10.00
Chicago	5.50 to 6.00
Cleveland	10.25 to 10.50
Cincinnati	8.00 to 8.50
Detroit (dealers)	7.00 to 7.50
Eastern Pennsylvania	10.50
New York (dealers)	7.00 to 7.50
Pittsburgh	10.00 to 10.50
St. Louis	7.50 to 8.00
Valleys	11.00

CAST IRON BORINGS

Birmingham (chemical)	18.00 to 19.00
Birmingham (plain)	9.00 to 10.00
Boston (chemical)	9.00 to 10.00
Boston (dealers)	8.00 to 8.50
Buffalo	13.00 to 14.00
Pittsburgh	12.00 to 12.50
Chicago	9.50 to 10.00
Cincinnati	9.00 to 9.50
Cleveland	10.50 to 11.00
Detroit (dealers)	9.00 to 9.50
Eastern Pennsylvania	11.50 to 12.00
Eastern Pennsylvania (chem.)	15.00 to 16.00
New York (dealers' price)	7.50 to 8.50
St. Louis	10.50 to 11.00
Valleys	12.00 to 12.25

MIXED BORINGS AND TURNINGS
(For blast furnace use)

Boston (dealers)	7.00 to 7.50
Cleveland	10.25 to 10.75
Detroit (dealers)	8.50 to 9.00
Eastern Pennsylvania	10.00 to 12.00
New York (dealers)	7.00 to 7.50

IRON AXLES

Birmingham	23.00 to 24.00
Boston (consumers)	31.00 to 32.00
Buffalo	28.00
Chicago	27.50 to 25.00
Cincinnati	22.00 to 22.50
Eastern Pennsylvania	30.00 to 33.00
New York (dealers)	27.00 to 28.00
St. Louis	27.00 to 27.50

IRON RAILS

Buffalo	19.00 to 20.00
Chicago	18.50 to 19.00
Cincinnati	13.00 to 13.50
St. Louis	14.50 to 15.00

PIPES AND FLUES

Chicago	7.50 to 8.00
Cincinnati	8.50 to 9.00
Cleveland	9.50 to 10.00
St. Louis	7.75 to 8.25

RAILROAD GRATE BARS

Buffalo	16.00 to 17.00
Chicago	15.75 to 16.25
Cleveland	14.50 to 15.00
Eastern Pennsylvania	16.00
New York (dealers)	14.00 to 14.50
St. Louis	12.75 to 13.25

FORGE FLASHINGS

Boston (dealers)	8.50 to 9.00
Chicago, small	9.00 to 9.50
Cleveland, small	10.00 to 10.25
Cleveland, large	9.50 to 9.75
Detroit (dealers)	9.00 to 9.50

FORGE SCRAP

Boston (dealers)	8.50 to 9.00
Chicago	13.50 to 14.00
Eastern Pennsylvania	12.50 to 13.00

ARCH BARS AND TRANSOMS

Chicago	20.50 to 21.00
St. Louis	19.50 to 20.00

ANGLE BARS—IRON

Chicago	19.50 to 20.00
St. Louis	18.50 to 19.00

Iron and Steel Works Scrap

AXLE TURNINGS

Boston (dealers)	9.00 to 9.50
Buffalo	14.00 to 14.50
Chicago	11.00 to 11.50
Cleveland	11.75 to 12.00
Eastern Pennsylvania	13.50 to 14.50
Pittsburgh	14.00 to 14.50
St. Louis	10.50 to 11.00

STEEL CAR AXLES

Birmingham	19.00 to 20.00
Boston (consumers)	22.00 to 23.00
Buffalo	18.00 to 19.00
Chicago	18.00 to 18.50
Cleveland	17.50 to 18.00
Eastern Pennsylvania	20.00 to 21.00
New York (dealers)	nominal
Pittsburgh	18.50 to 19.00
St. Louis	17.00 to 17.50

SHAFTING

Boston (consumers)	19.00 to 20.00
Chicago	21.00 to 21.50
Eastern Pennsylvania	20.00 to 21.00
New York (dealers)	14.00 to 15.00
St. Louis	17.00 to 17.50

Iron Foundry Scrap

CAR WHEELS

Birmingham, tram car	18.00 to 19.00
Birmingham, iron	17.00 to 18.00
Boston (consumers)	22.00 to 23.00
Buffalo, iron	15.50 to 16.50
Chicago, iron	17.75 to 18.25
Cincinnati	12.50 to 13.00
Eastern Pennsylvania	18.50 to 19.50
New York iron (dealers)	16.00 to 17.00
Pittsburgh, iron	16.00 to 16.50
Pittsburgh steel	18.00 to 18.50
St. Louis, iron	17.00 to 17.50

NO. 1 CAST SCRAP

Birmingham, cupola	19.00 to 20.00
Boston (consumers)	22.00 to 22.50
Buffalo	19.00 to 19.50
Chicago, cupola	20.50 to 21.00
Cincinnati No. 1 machinery cupola (net tons)	18.50 to 19.00
Cleveland, cupola	19.50 to 20.00
Detroit (net ton) (dealers)	16.00 to 16.50
Eastern Pennsylvania, cupola	19.00 to 20.00
New York, cupola (dealers)	17.00 to 17.50
Pittsburgh, cupola	18.50 to 19.00
San Francisco	28.00
St. Louis, railroad	18.00 to 18.50
St. Louis, agricultural	18.00 to 18.50
Valleys	21.00 to 21.50

HEAVY CAST

Boston (consumers)	19.00 to 19.50
Buffalo	14.00 to 15.00
Cleveland	12.75 to 13.00
Detroit (automobile) (net ton)	21.00 to 21.50
Eastern Pennsylvania	16.50 to 17.00
New York (dealers)	16.00 to 16.50
Pittsburgh	14.00 to 14.50

MALLEABLE

Boston (railroad) (consumers)	20.00 to 21.00
Buffalo	17.00 to 18.00
Chicago, railroad	19.00 to 19.50
Chicago, agricultural	19.00 to 19.50
Cincinnati, agricultural	13.50 to 14.00
Cincinnati, railroad	13.50 to 14.00
Cleveland, agricultural	18.00 to 18.25
Cleveland, railroad	18.50 to 19.00
Detroit (dealers)	17.00 to 17.50
Eastern Pennsylvania, railroad	16.50 to 17.00
Pittsburgh, railroad	18.00 to 18.50
St. Louis, agricultural	15.00 to 15.50
St. Louis, railroad	15.00 to 15.50

Miscellaneous Scrap

RAILS FOR ROLLING
5 feet and over

Birmingham	15.00 to 16.00
Boston (dealers)	12.00 to 12.50
Chicago	15.00 to 15.50
Cleveland	17.50 to 18.00
Detroit	11.50 to 12.00
Eastern Pennsylvania	17.50 to 18.00
New York (dealers)	14.50 to 15.00
Pittsburgh district	17.00 to 17.50
St. Louis	12.75 to 13.25

LOCOMOTIVE TIRES

Chicago	16.75 to 17.25
St. Louis	15.50 to 16.00

LOW PHOSPHORUS PUNCHINGS

Chicago	15.50 to 16.00
Eastern Pennsylvania	20.00 to 21.00
Pittsburgh	18.00 to 18.50